VOL. XLIV

FLIGHT

1/-

and The AIRCRAFT ENGINEER

OFFICIAL ORGAN OF THE ROYAL AERO CLUB

SEPTEMBER 16th, 1943

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Lockheed

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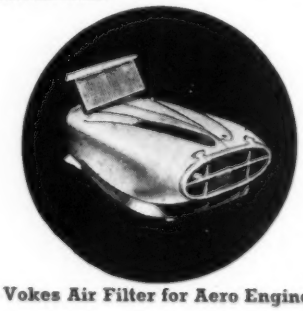

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FLIGHT and The AIRCRAFT ENGINEER

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The Outlook

Italy and the Air

NOWADAYS no one except Major Seversky believes that a war can be won by air alone. He believes it because he is fighting this war with next war's weapons. Even Viscount Trenchard, who was for many years what we may perhaps be forgiven for describing as a lonely voice booming in the wilderness, does not subscribe entirely to the extreme Seversky doctrine.

> "We must be careful," Lord Trenchard said in a recent letter to the *Daily Telegraph*, "when comparing wars fought in two dimensions, which has been the case ever since the world began, with wars fought in three dimensions, as they are to-day. Although the fundamental principles remain the same, their application in practice is vastly different, as we have seen and are seeing in every present theatre of war."

Pantellaria surrendered to air power, but it was a small island cut off from its source of supplies, and thus could not be taken as a valid proof that any enemy can in all cases be beaten into subjection by air action alone.

Italy comes nearer to giving that proof than anything which has gone before. The bombing of her airfields, factories, lines of supplies and communications had a devastating effect, and although it may be argued that had the British and American armies and navies not been there to follow up the air preparation Italy might not have given in so readily and completely, the fact remains that the only serious damage we did to Italy's power of defence was done by the air arm. Marshal Badoglio, in his explanatory telegram to Hitler, referred to the fact that Italy "continued to suffer the destructive air bombardments"; that "her industries were paralysed, and her communications, so important because of the geographic formation of the country, were thrown into confusion"; and that "there was not a single point in the national territory which was not open to enemy attack."

To argue whether or not Italy could have been brought to her knees by air alone had not sea and land forces been ready to follow up is beside the point. In no other way than that followed could such vast results have been achieved at such insignificant losses in men and material. That appears to be the great lesson to be learned from the Italian capitulation.

Italian Airfields

FROM the air point of view one of the most important aspects of the surrender of Italy is the placing at the disposal of the United Nations of most of the airfields in the country, as well as those in Sardinia and perhaps Corsica also. For a long while past the *Regia Aeronautica* had ceased to be an important factor in the war, but its airfields have always been of importance, and they will certainly continue to be so.

In the hands of the Germans these airfields have launched irritating attacks on Allied positions. Only a few days before the announcement of the Armistice with Italy there was a night raid on Bizerta; and on the eve of Malta's national day (September 8th) the sirens on the island sounded for the 3,334th time—to be speedily followed by a flash of light as an enemy aircraft (perhaps the last) was shot down into the sea.

No doubt the Germans will fight hard to retain as many of these airfields as possible, but the power of the *Luftwaffe* in the Mediterranean will be immensely curtailed. When the Allies are able to operate from the bases in the North of Italy, many centres in Southern Germany, Austria and Czechoslovakia will be brought within easy bomber range. In any case, flights across the Adriatic against the Germans in the Balkans will

become possible almost at once, and such defences as the Germans have been able to construct along the coast of the French Riviera will be made subject to a "softening" process of air bombing. Rhodes and the Dodecanese will become a help instead of a threat.

Other helpful results will follow the removal of all danger from the Italian fleet, whose battleships are still formidable, even though the number of cruisers and destroyers has been severely cut down. It will still be necessary to watch for German U-boats, but the sum total of air patrol over the Mediterranean will not need to be so thorough as it has been. Likewise, the powerful British Navy in the Mediterranean, which included no fewer than six battleships and many cruisers and light craft, will no longer be needed in the inland sea. A much more modest force will suffice for watch and ward, and that thought will hardly bring peace to the minds of Admiral Tojo and his colleagues.

Nothing has been heard of carriers in the Mediterranean for a long time past, but undoubtedly some were there, for British Admirals know well the importance of having such vessels with the fleet. The Pacific war will find employment for all the carriers which Britain and the United States can muster. The conquest of Sicily and its sequel will certainly have repercussions in the Japanese Capital.

Civil Repair Organisations

WELL-EARNED words of praise were given by the Minister of Aircraft Production, Sir Stafford Cripps, the other day to workers at a civil repair factory "in the Home Counties."

These aircraft repair establishments are, as Sir Stafford rightly pointed out, as vital to the efficiency of the R.A.F. and Fleet Air Arm as are the main construction factories. The work is of a very different nature. When the wreckage is brought in there is nothing cut and dried about the procedure. Each crashed aircraft has to be judged individually, a decision made as to repair, salvage for spares, or scrap. If the former, there is still no hard and fast rule to follow, so that the work requires in many ways more ingenuity than straightforward production, which is entirely routine.

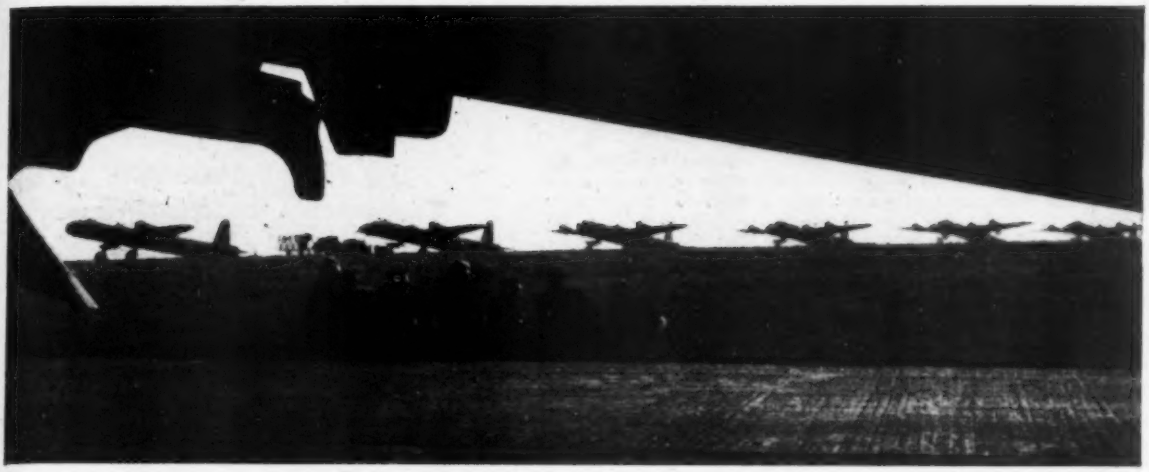
Sir Stafford's figures were illuminating. For every 100 airframes, engines and airscrews repaired in the first half of 1940, there were 1,080, 945 and 2,207 respectively in the first half of 1943. Output as a percentage showed a similar growth in the same period. Repaired aircraft formed 13 per cent. of new production in 1940 and 70 per cent. in 1943.

Bearing in mind the vast increase in production, that figure is extremely impressive.

CONTENTS

The Outlook	299
War in the Air	301
Here and There	304
The King's Standard	305
Let Us Be Honest	308
Behind the Lines	310
Aircraft Characteristics	310, a & b
Airscrews	311
Fighter Escort	314
German Aircraft Structures	315
Correspondence	320
Service Aviation	321

CROSS-WIND TAKE-OFF: A Fairey Fulmar making an assisted take-off from one of our 23,000-ton aircraft carriers. To save a carrier leaving its battle station and steaming into wind for its aircraft to take-off, an accelerator on the port side of the flight deck is used. The aircraft run is nearly twice the length of a normal catapult take-off. Judging from the close proximity of snow-covered mountains in the background, the carrier was in restricted waters when this photograph was taken and could not steam into wind.



Short Stirlings taxying to the take-off point for the great Berlin raid on the last night in August.

WAR in the AIR

The Surrender of Italy : The Landing Near Lae : Great Exercise in the Channel : U.S. Aircraft Carriers

THE surrender of Italy sets one's mind working on the past, turning to the days when the Fascists clamoured for "Nice, Tunis, Corsica, Djibuti," and to the days of sanctions, when Britain hurried fighter squadrons over to Egypt, and their pilots wondered, with uneasiness but without fear, whether their Bulldogs would be a match for the Italian fighters if it came to war. In those days Sir Samuel Hoare was our Foreign Minister, and he declared, in tones which hardly sounded as if he believed his own words, that if it came to war Britain would certainly beat Italy.

And now—not even German aid has saved Italy from the penalties for her aggression. Italy, in fact, was beaten before the Germans (or for that matter our very highly valued American Allies) came on the scene. As it is, we are glad to recognise the very great share which the United States has contributed to the common victory; and that victory is all the more creditable because the German Army and Air Force made a very strenuous effort to avert the collapse of Italy.

And as for France—Tunis and Djibuti are now safe for her, Corsica will certainly soon be in the hands of the United Nations, and we see the best grounds for hoping that Nice and the rest of France will before too long be in like case.

At the moment the joy in Britain over the surrender of Italy is so great that it is almost excusable if British eyes are concentrated on the Mediterranean, and are hardly to be diverted to other fronts of this world war. That cannot be the frame of mind of Hitler and his gang. They would have to take in all the defeats on all sides which their cause has suffered in the last few weeks. The Russian armies roll on like the steamroller to which we used to compare them in the days of 1914, but now the simile is far more just.

On the Eastern Front air power darts in and out of the limelight in a bewildering way. At one moment it is reported as the most active arm on a certain sector, and then it figures no more in the news for days or even weeks at a time. So far as can be judged at this distance, the Russians

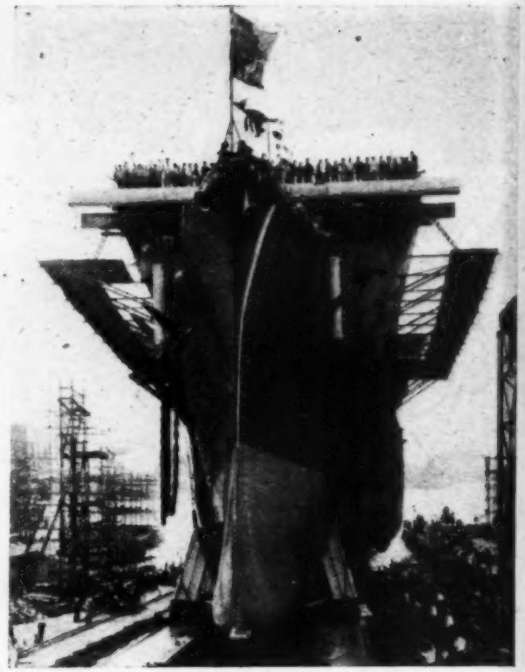
BOWHILL'S BARROWS : The aircraft park at one of the many R.A.F. Transport Command stations which are dotted over most of the surface of the globe.

WAR IN THE AIR

regard the artillery as their main arm, but they use aircraft as and when they judge necessary, chiefly to bomb railway stations behind the German lines. Strategic bombing does not appeal to them, and their papers are sometimes inclined to pooh-pooh the effects of R.A.F. Bomber Command's offensive. They have said that it has not drawn away a single German division from the Eastern Front. They overlook the fact that it has tied down some million-and-a-half men to air defence, as well as about half the force of German fighters. But the Russian victories have been so glorious that we are not inclined to bandy words with their newspapers, and it is certain that Britain and the United States will waste no time in establishing a Western Front in Europe. To have attempted it before our forces were ready would have been to ask for a repulse, which would certainly not have helped the Russians.

Japan must also be seeing the writing on the wall. The landing of Australian and American troops near Lae, in New Guinea, was a copy on a small scale of the perfect organisation and staff work which marked the Allied landings in North-West Africa, in Sicily, and in Calabria. About three years ago it was sarcastically said that the British were the greatest masters of the art of evacuation that the world had ever seen. Now we, including Dominion troops and in conjunction with Americans, are the greatest experts at landing on enemy shores.

The Japanese round Lae were taken completely by surprise. Australian regiments from another part of the island forced their way through the jungle to link up with the troops which had landed, and American parachutists dropped in the rear of the Japanese. General MacArthur flew over in a Fortress to watch the parachutes go down. The landing transports were guarded by a completely successful screen of American war ships and by aircraft overhead. All three services combined as thoroughly as they did in the Mediterranean campaign, and again fought as one nation.



PHILIPPINIAN MEMORIAL: Launching the U.S. Aircraft Carrier *Bataan* from the New York Shipbuilding Corp. yards at Camden, N.J.

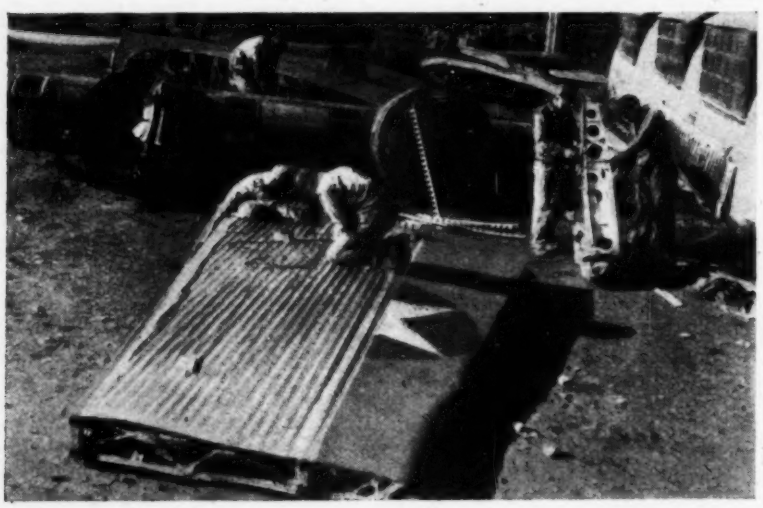
Puzzles for Germany

THE command of the sea in the Mediterranean has given the United Nations the power to outflank the Germans in Italy at their will, and prompt advantage was taken of this by landing American troops in the neighbourhood of Naples. It came as a surprise to people in Great Britain that the troops landed were elements of the American Fifth Army. This left unanswered the question, where was the American Seventh Army which had fought so well in Sicily? The Germans may have known what that Army was about, but with the cessation of Italian air reconnaissance the supply of information reaching the Germans must have been diminished.

Another puzzle was set by the great combined exercise carried out in the Channel on September 9th. The Germans may have wondered whether the real invasion of the Continent had really started, but if they concluded that it was only a practice they would still be left in uncertainty as to the spot at which the Allies intended to strike. A notable fact about the exercise was the absence of the *Luftwaffe*. The airfields in the neighbourhood were ruthlessly strafed all day by all appropriate types of fighter-bombers and bombers, and their work may have made it impossible for the Germans to take to the air—though bombing of airfields does not always have such an effect. Another possibility is that the news from Italy had led the Germans to withdraw squadrons from northern France, though that seems hardly likely. At any rate, the swarms of Spitfires and other protecting fighters which provided the air umbrella over the great assembly of vessels in the Channel met with no interference. Altogether some 3,000 sorties were flown by aircraft based on Britain that day, 1,000 of them by machines of the U.S. Army Eighth Air Force. This was the greatest effort yet made by that growing force.

The Germans may also be wondering what is meant by Persia's declaration of war on them. It may mean little, but it may mean much. At the very least it shows that belief in a German victory is no longer universal, and doubt of it is evidently spreading among the satellite countries, such as Bulgaria and Rumania.

The United States Navy Department has published a piece of news which is not calculated to cheer up the spirits of the Japanese war lords. Mr. Forrestal, the Under-Secretary of the Department, has announced that by the end of this year there would be



REPAIR OR SALVAGE? Damaged Flying Fortresses at an American base in Britain.

TWELVE-GUN BOMBER: The new Martin Marauder (B 26 C) which has an increased wing span and carries an extra battery of four fixed forward-firing 0.5in. machine guns in nose blisters. The other eight 0.5in. guns are placed two in the tail, two ventral, two dorsal and two in the nose.

WAR IN THE AIR

more than 14 first-line carriers with the fleet, not counting the small converted merchantmen which have proved very useful in escorting Atlantic convoys.

The Italian Fleet

THE surrender of the Italian fleet to the United Nations, and the arrival of most of its ships in Malta and other Allied ports, finally clears the Mediterranean of hostile elements, except for such German U-boats as may make their way into that sea through the Straits of Gibraltar, and, of course, the *Luftwaffe*. But the activities of the latter have been circumscribed by the growing number of airfields occupied by the forces under the command of General Eisenhower. The effort which Britain and the United States must make to control the inland sea for the future will be but a fraction of the efforts which Admiral of the Fleet Sir Andrew Cunningham has had to put forth in the last three years.

The crossing of the Italian warships from Spezia to the protection of the British fleet was marked by the sinking of the battleship *Roma* by German aircraft in the neighbourhood of the Straits of Bonifacio, between Corsica and Sardinia. Once again the Italians had reason to regret that they had never built aircraft carriers, whose fighters might have saved this capital ship. As we write it is not known whether she was sunk by bomb or torpedo, and the point is important. We cannot recall a case in which a capital ship has been sunk by bombs, though tragic experience in the Malaya campaign has taught the British how deadly air torpedoes can be.

The *Roma* would doubtless have been very useful to us if she had fallen into our hands, as the other Italian warships may well be in due course, but evidently it would not have been wise for the British Admirals to have risked their own carriers so near to enemy shore bases in order to protect the Italians. Only reconnaissance aircraft of the R.A.F. were near the Italians when the Germans attacked, and the *Luftwaffe* bombers had only the A.A. fire from the ships themselves to face when they attacked.

In the meantime the Japanese have lost the airfield at Salamaua, and that at Lae may have fallen likewise before these words have been published.

If the Germans are to be believed, a new use has been found for parachute troops. They are said to have rescued Mussolini before the Italians had handed him over to Allied custody.

The Allied advance on the mainland of Italy was for a time a struggle for airfields. Lightnings did some fine work in tackling German aircraft which tried to interfere with the Fifth Army, but the position was not really comfortable until airfields were captured which would allow Spitfires to cover the ground troops.

U-boats in the Bay of Biscay have been having a poor time of late. New types of sloops specially designed for hunting submarines have been produced by the Admiralty, and the co-operation between naval vessels and aircraft of Coastal Command has grown still better than it was before. The latest type of U-boat has improved *flak* power, and groups of three have tried to fight it out on the surface instead of seeking safety by submerging. Depth charges from the air and similar weapons plus gunfire from the naval vessels have resulted in some very successful actions and damaging losses to Hitler's last hope.

BRITISH & U.S. AIR LOSSES to SEPT. 11th

	Over G.B. A'crft.	Continent B'brs.	Continent F'trs.	Middle East A'crft.	N.W. Africa A'crft.
Sept. 5	0	34	3	0	2
6	0	49	5	0	4
7	0	0	0	0	4
8	0	0	5	0	6
9	0	5	5	0	7
10	0	0	1	0	10
11	0	0	5	0	7
	0	88	24	0	40

Totals: West, 7,621; Middle East, about 2,266; North West Africa, 1,210.

ENEMY AIR LOSSES TO SEPT. 11th

	Over G.B.	Continent.	Middle East	N.W. Africa
Sept. 5	0	16	0	7
" 6	2	13	0	17
" 7	0	0	0	13
" 8	3	10	13	33
" 9	1	1	9	11
" 10	0	1	1	45
" 11	0	15	0	16
	6	56	23	142

Totals: West, 7,452; Middle East, over 5,639; North West Africa, 3,250.

A.T.A. Benevolent Fund

LATEST LIST OF SUBSCRIPTIONS.

	£	s.	d.
Donations Already Acknowledged	£8,101	10	7
Subscriptions by members of A.T.A. & B.O.A.C.	2,775	17	7
Boulton Paul Aircraft, Ltd.	52	10	0
Short & Harland, Ltd.	50	0	0
Hobbies, Ltd. (2nd donation)	14	14	0
H. M. Hobson Components, Ltd.	10	10	0
Brush Electrical Engineering Co., Ltd. (2nd donation)	10	10	0
Hickman (1928), Ltd.	5	5	0
Wrightways, Ltd.	5	5	0
Walter - Denis Contacts Co., Ltd.	5	5	0
Martin Hearn, Ltd.	5	5	0
Tavistock Engineering Co., Ltd.	5	5	0
North-Eastern Airways, Ltd.	5	5	0
Rover Co. Ltd. (3rd donation)	5	0	0
D. Lloyd and Co.	2	2	0
Walthamstow Wing Air Training Corps	1	4	0
Miss P. Barnes	1	1	0
Anonymous		3	6
GRAND TOTAL	£11,056	12	8

HERE AND THERE

Cockpit Monologue

INSTEAD of using a pad and pencil, Allied airmen on reconnaissance trips over enemy territory can now dictate their observations into a microphone. The speech is recorded on thin wire wound round a spool of 3in. diameter. The recorder, which it is hoped to make by mass-production methods, weighs 9 lb., and 26 minutes of speech can be accommodated.

Still They Come!

YET another American airline company, the Trans-Continental and Western Air, Incorporated, is applying for permission to establish a trans-oceanic service. They are planning to operate a service between Los Angeles and Honolulu after the war.

Baker's Dozen?

THE Navy Department of America has announced that "approximately a dozen" aircraft carriers have been launched since Pearl Harbour. It is also revealed that the Navy will have 27,500 bombing, fighting and cargo aircraft in service by the end of this year, operating from carriers and from naval bases in all parts of the world.

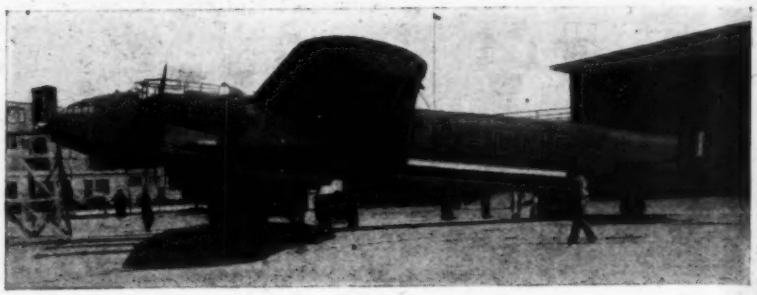
Another Change of Name

LAST week, in this column, *Flight* announced a change of name by a well-known industrial firm; now another one is announced.

M.R.C., Ltd., proprietors of the Teleflex system of remote control, have changed their name to Teleflex Products, Ltd.

New U.S. Torpedo-bomber

CONSOLIDATED is to begin production of a new torpedo-bomber, to be known as the Seawolf, for the American navy. With a gross weight of eight tons it is to carry a crew of three. According to Rear Admiral Ralph Davison, Assistant Chief of the Bureau of Aeronautics, "there is no other in the world to match it." There is a saying about counting chickens before they are hatched.



YANCASTER? Readers will have no difficulty in recognising this transport aircraft which is now in service with T.C.A. on the Canadian Government's new wartime transatlantic service. Primarily engaged on the carriage of mail for the Dominion Forces, it could be described as half-way between a Lancaster and a York. Piloted by Capt. R. F. George, operations manager of T.C.A., and with Sqn Ldr. J. R. Gilmour, R.C.A.F., as navigator, it recently flew from Montreal to Britain in the record time of 12 hr. 26 min.

Company Appointments

MR. H. R. TROST, B.Sc. (Engineering), M.I.Mech.E., who was formerly a director of the Airscrew Co., Ltd., has been appointed managing director of Redwing Aircraft Co., Ltd., and Fairfield Aviation, Ltd.

Mr. J. W. Beak and Mr. J. K. Lane, general managers of Redwing and Fairfield respectively, become directors of those firms.

Mr. R. C. Bartlett remains governing director of both firms as before.

Complementary Services

THE first of a series of joint meetings has been held at the Royal Aero Club between representatives of the British Airlines Pilots' Association, the Guild of Air Pilots and Navigators of the British Empire, test pilots, licensed aircraft engineers and the Officers' (Merchant Navy) Federation.

It was agreed that the interests of air and sea transport were not conflicting but complementary, and that it was best to plan together for post-war activities. Permission to alter their articles of association to enable them to engage in air, as well as sea, transport after the war has been applied for by some of the shipping companies.

New Jap Fighter

REPORTED to bear certain resemblances to the Kittyhawk in appearance, a new Japanese fighter was shot down recently over the Solomons.

Details of the machine as yet to hand are only sketchy, but it is said to possess a liquid-cooled engine, giving it greater speed than the Mitsubishi S-00 (known to the Americans as the Zero), and to be more heavily armed.

Known as the "Type Three" this new Jap fighter has self-sealing fuel tanks, and is described as being of good workmanship—as, indeed, is the S-00.

Home War-work

AT the present time some 20,000 people in Britain are engaged on war work at home or in specially formed groups outside the factories, and the Ministry of Production has issued an informative little brochure describing the nature of this type of war effort for the guidance of firms in congested industrial areas where additional labour is still required to meet expanding production programmes.

Officially known as "Outwork," it releases factory workers for other jobs which cannot be done outside, and it ranges from inspection of small parts and units to the assembly of various components small and light enough to be carried home.

Jobs of a heavier nature, calling for the use of rather more elaborate equipment, are undertaken by voluntary groups using halls or other premises in suitable centres, and some of the most successful schemes of outworking have been organised in large private houses.

"Flight" Index and Binding Cases

The index to *Flight* for the period January-June, 1943, is now ready, and copies may be obtained from our offices, price 1s. 1½d. by post, or with cloth binding case for the volume, 4s. 11d. Readers who desire to have their copies bound in the publishers' binding case are asked to send the copies at once. The inclusive cost of binding and the return of the complete volume is 13s. 9d.

AMPHIBIOUS DAKOTA: Experiments are being made with the Douglas C-47 at Wright Field, U.S.A., as an amphibious transport. The wheels retract into the floats, which are fitted with small sea-rudders as shown.

The King's Standard

Award to 30 Squadrons

By MAJOR F. A. de V. ROBERTSON, V.D.

THE twenty-fifth anniversary of the Royal Air Force on April 1st, 1943, was marked by a declaration by His Majesty the King that he would award special standards to operational squadrons which have a long and distinguished record of service. Thirty squadrons have now been selected for this distinction on the ground that they have completed 25 years of existence in the Royal Air Force, including service in either the Royal Flying Corps or Royal Naval Air Service. No doubt other squadrons will in due course be honoured on the grounds of distinguished service.

The standards will not be made until after the war, and will be consecrated on presentation. Each standard will have the squadron badge on a light-blue silk background and will be fringed and tasselled. Scrolls for battle honours will be added as necessary. The staff will be surmounted by a gilt eagle.

The good custom is being introduced of conferring names on some R.A.F. squadrons. Those of the Auxiliary Air Force were always known by the county or city in which they were raised, but the names recently given have usually been those of the State or Colony of the Empire which gave the funds to pay for the squadron's equipment, such as the Hyderabad Squadron, the Mysore Squadron, the Natal Squadron, and so on. These names mostly apply to squadrons raised or reformed during the present was, which, naturally, cannot boast 25 years of service. Therefore the list of those to which standards have been granted is just a string of figures, which can mean little or nothing to the man in the street, or, for that matter, to the man in the Navy or Army. This article will try to clothe the bare bones of the figures with a little flesh and blood.

No. 1 Squadron :
In omnibus princeps

No. 2 Squadron :
Hereward

No. 3 Squadron :
Tertius primus erit

For various reasons, some of them obvious, it will not be possible to say much about the doings of many of these squadrons during the present war, but a glance back at their earlier history may be not without interest. The list is: Nos. 1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 14, 20, 24, 25, 27, 28, 30, 31, 39, 45, 47, 55, 56, 60, 70, 84, 100, 207, 208 and 216.

The Old Guard

No. 1 Squadron's history goes back to the earliest days of the R.F.C. Originally it was equipped with airships and was commanded by Maj. (later Air Commodore) E. M. Maitland. In that form it was handed over to the R.N.A.S., but the R.F.C. set to work to "reorganise" No. 1, which really meant raising a new squadron. In March, 1915, it flew to France with Maj. Geoffrey Salmond (afterwards C.A.S.) as its C.O. and made a name for itself by good co-operation with the artillery. Among its C.O.s were Maj. Joubert de la Ferté, now well known to everybody. By January, 1917, it had become a fighter squadron. In the inter-war years it served in India and Iraq. In 1927 it settled down at Tangmere, and in 1939 it flew its Hurricanes to France as part of the Advanced Air Striking Force. In the Battle of Britain it fought by night with great success, and the one-armed pilot, Sqn. Ldr. J. A. H. Maclachlan, won his D.S.O. while with this squadron.

Nos. 2, 3, 4 and 5 were the original squadrons which flew to France with the Old Contemptibles in 1914. No. 2 provided the first air V.C. in 2/Lt. W. B. Rhodes-Moorhouse, whose son won the D.F.C. and fell in action in the present war. Nos. 2 and 4 Squadrons afterwards became Army Co-operation Squadrons, and in 1939 both were equipped with Lysanders. They formed part of the Air Component which accompanied the B.E.F. to France in 1939, and one Lysander shot down two Me 109s, to the great surprise of everybody concerned.

No. 3 became a fighter squadron, and for years it and No. 17 occupied Upavon station, and were the only two squadrons to be equipped with Woodcock night-fighters. Afterwards they were the first two to receive Bulldogs.

No. 3 had Hurricanes in 1939, and in May, 1940, the squadron was sent to France to help the hard-pressed Air Component. In eleven days of fighting it shot down 60 enemy aircraft. No. 5 also became an Army Co-operation Squadron and was stationed at Risalpur, on the Indian frontier.

No. 6 Squadron spent the inter-war years at Ismailia, on the Suez Canal, as a bomber unit. No. 7 was one of the first units to be trained after 1918 as a night-bomber squadron. For many years it lived at Worthy Down, sharing the base with No. 58, and both enduring long periods of the Virginia, later replaced by the Heyford. In the present war No. 7 Squadron has accumulated an unusually long list of awards for deeds of valour.

No. 8 has always been an interesting squadron because for most of the inter-war years it was stationed at Aden and, apart from armoured cars, was the only R.A.F. unit there. Yet the A.O.C., Aden, was responsible for the defence and the internal peace of the town and hinterland, and the squadron reduced police bombing to a fine art. Its boast was that it scored the maximum of success with the minimum of casualties inflicted on the tribesmen. In 1939 it was equipped with Vincents, and these did useful work in the East African campaigns.

No. 11 Squadron had not much to spare in qualifying for the standard. It was formed in 1915, but was disbanded in December, 1919. For three years it continued in a state of suspended animation, but was reformed as a bomber squadron in January, 1923. Its station was Netheravon, and the

No. 4 Squadron :
In futurum videre

No. 5 Squadron :
Frangas non flectas

No. 6 Squadron :
Oculi exercitus

No. 11 Squadron :
Ociores acrioresque aquilis

No. 12 Squadron :
Leads the field

present writer remembers seeing it send off a flight during the air exercises of July, 1927. Two years later it was sent out to India and stationed at Risalpur.

No. 12 Squadron has as its badge a fox's head in memory of the fact that it was the only squadron to be equipped with the Fox bomber when the Fairey Aviation Co. designed the type round the Felix (or Curtis D 12) engine. This design introduced a new era in light single-engined bombers, and none of the fighters of the day could overhaul the Fox. In 1939 No. 12 was equipped with the Fairey Battle, and went to France as part of the Advanced Air Striking Force. It was stationed at Amifontaine.

Gallant No. 12 Squadron

On May 12th of that year No. 12 Squadron won the first two air Victoria Crosses of the present war, when it bombed the Maastricht bridges. The order that the bridges must be destroyed at all costs was explicit, but the operation meant almost certain death. No. 12 was the squadron chosen, and the C.O. called for volunteers. All the air crews stepped forward without hesitation, and lots were drawn as to which of them should go. Six Battles were despatched and five were shot down. The pilot and observer in the leading machine, F/O. D. E. Garland and Sgt. T. Gray, were both awarded posthumous Victoria Crosses. The surviving pilot received the D.F.C.

No. 14 Squadron :
Ana asaf u'ana afi

No. 20 Squadron :
Facta non verba

No. 24 Squadron :
In omnia parati

No. 14 Squadron, like No. 8, occupied a post of unusual interest throughout the inter-war years. Its station was Amman, in Transjordan, and its D.H.9A bombers with Liberty engines regularly patrolled the deserts to the east of Palestine. It was seldom in action, but its presence was largely responsible for the peace which the realms of the Amir Abdullah enjoyed. Transjordan came under the Middle East Command, and that Command has made a glorious name for itself in the African campaigns.

The outbreak of the present war found No. 20 Squadron allocated to army co-operation work in Peshawar. That work is one of the most interesting and, so to speak, intellectual jobs in the Royal Air Force. But to lovers of squadron history it always seemed rather deplorable that No. 20 should be anything but a fighter squadron, because its record as a fighter in the first world war was so very fine. It was one of the most prominent—perhaps the most prominent—of the units equipped with the F.E.2—the "fighting Fees" as Boyd Cable (Col. A. E. Ewart, who died only the other day) called them. The F.E.2B was one of the fighter types which mastered the Fokker monoplane. It was a two-seater pusher, with the observer sitting in front of the pilot. However, in the inter-war years fighter squadrons were not wanted on the N.W. Frontier, while Army Co-operation Squadrons were of the utmost use.

No. 28 Squadron :
Quicquid agas age

No. 31 Squadron :
In caelum indicum primus

No. 24 was not an operational squadron between 1918 and 1939. It was the one and only communications squadron, a sort of germ from which sprang Ferry Command. It took Prime Ministers and senior officers about the country on their lawful occasions. The standards have been awarded by the King to operational squadrons only, and as No. 24 is included in the list, that speaks for itself.

No. 25 was for some years the most notable of the fighter squadrons in Great Britain. It was stationed at Hawkinge, and when Sqn. Ldr. A. H. Peck was its C.O. it was chosen for two years running to perform squadron aerobatics at the Hendon Display. It devised the beautiful manœuvre known as the Prince of Wales' Feathers, and the order to reverse direction by means of that manœuvre was given to it by wireless at one Display by King George V himself. However, at the outbreak of war the squadron was equipped with Blenheims and was stationed at Northolt. On the day after the declaration of war the squadron was out on the raid, and on November 26th, 1939, its Blenheims attacked the seaplane base at Borkum. Until the end of the year it worked over the North Sea, but in 1940 it became a night fighter squadron, and as such it did great work during the Battle of Britain. In May and June, 1941, it shot down 13 enemy raiders and damaged many more. By that time Beaufighters had supplanted the Blenheims, but another change in equipment was made and the squadron now flies Mosquitoes. Up to date it has shot down over 30 enemy aircraft, all by night.

Nos. 27 and 28 Squadrons belonged to the India Command, the former having been a bomber squadron at Kohat and the latter an Army Co-operation Squadron at Ambala.

No. 30 was a bomber squadron at Habbaniya, in Iraq, but it had moved to

No. 25 Squadron :
Feriens tego

No. 27 Squadron :
Quam celerrime ad astra

No. 39 Squadron :
Die noctuque

No. 45 Squadron :
Per ardua surgo

KING'S STANDARD

No. 55 Squadron :
Nil nos tremefacit

No. 56 Squadron :
Quid si coelum ruat

a more active area before the revolt broke out. No. 31 was an Army Co-operation Squadron at Karachi and No. 39 a bomber squadron at Risalpur. No. 45 was a bomber squadron at Helwan on the Nile, and No. 47 another bomber squadron at Khartum. No. 55 was another of the Iraq squadrons, but a particularly interesting one, as it was classified as a bomber-transport. It had also left Habbaniya before the rebellion. In connection with Iraq it is interesting to recall that Nos. 30, 45, 47, and 70 were all at one time engaged in running the air mail between Baghdad and Cairo. No. 216, from Heliopolis (outside Cairo), was also engaged in this work, and it is still used as a transport squadron in the Middle East.

No. 56 Squadron won for itself a most glorious record in the last war. Among its pilots were Capt. Albert Ball and Major McCudden, both winners of the Victoria Cross, and many other famous men. Its story has been finely told by two of its pilots, Cecil Lewis in "Sagittarius Rising," and Duncan Grinnel-Milne in "Wind in the Wires." In peace-time its station was North Weald, and when the present writer last had the pleasure of visiting the squadron (some years ago) it was equipped with Gauntlets, which were then the latest thing in British fighters. During the Battle of France No. 56 spent a lurid twelve days on the other side of the Channel, but on May 21st, 1940, the squadron flew back to England. It took part in the air fighting over Dunkerque during the evacuation of the B.E.F., and subsequently did a lot of convoy escort work over the Channel. In August, 1942, the Hurricanes of the squadron took part in the Combined Operations raid at Dieppe, where so many German aircraft were destroyed. Night-flying practice was started in October, 1942.

No. 60 Squadron :
Per ardua ad aethera tendo

No. 70 Squadron :
Usquam

No. 84 Squadron :
Scorpiones pungunt

Strange Genealogies

No. 60 Squadron, a bomber unit from Kohat, once had the curious experience of changing its designation. The original No. 60, which had been a great fighter squadron in the first world war, was disbanded in January, 1920. In April of the same year No. 27 Squadron at Risalpur was redesignated No. 60. The present No. 27 Squadron had also been disbanded in January, 1920, and reformed in India in the following April. This tangle ought to give genealogists a headache, but as both No. 27 and No. 60 have been awarded the Standard, evidently things have come out all right in the wash.

No. 100 Squadron :
Sarang tebuan jangan dijolok

No. 207 Squadron :
Semper paratus

No. 208 Squadron :
Vigilant

No. 216 Squadron :
CCXVI dona ferens

No. 84 Squadron was a bomber unit which spent many years in solitary splendour at Shaibah station, some 17 miles outside Basra, in Iraq.

Torpedo-bombers

No. 100 Squadron is the second unit which has been moved to an overseas station within the memory of the present writer. Some years ago I visited the squadron when it was at Donibristle. It was then flying Horsleys, but it had the distinction of being the only shore-based unit in Great Britain which used torpedoes. Not long after my visit it was given Vildebeests and sent out to Singapore. During the Japanese invasion of Malaya correspondents saw Vildebeests flying overhead at what seemed to them an incredibly slow speed. They did not state if the machines belonged to No. 100 or to No. 36.

No. 207 Squadron has won a great many honours during the present war. It is descended from No. 7 Squadron, R.N.A.S. For many years it was stationed at Bircham Newton, which it shared with No. 35 Squadron. Both were light bomber units, and I remember seeing No. 207 flying Fairey Gordons.

Having originally been No. 7 Squadron, R.N.A.S., No. 207 was the first heavy night bomber to be formed in the British Air Services. During the first six months of the present war it formed part of No. 1 Group Pool to supply aircraft and trained crews to the A.A.S.F., but that pool was disbanded in March, 1940. No. 207 was reformed at Waddington in November of that year and was equipped with Manchesters. It has made a number of raids on Brest, Hamburg, Kiel and other centres of German war effort.

No. 208 started the war as an Army Co-operation Squadron at Heliopolis. It was another "redesignated" squadron, for the original No. 208 was disbanded in November, 1919, and in February of the next year No. 113 Squadron at Ismalia was redesignated No. 208.

One cannot help sympathising with many squadrons which were disbanded soon after the Armistice in 1918 and were subsequently reformed, but not in time to have completed 25 years of service by April 1st last. It is always a bitter blow to a fighting unit to be disbanded and to have to break up the brotherhood of arms which has meant so much to every member, whether officer or airman. Individuals are often only too anxious to get back to civil life at the end of a war, but each would like to think that his squadron continued to exist. We all hope, and feel sure, that the end of the present war will not see a disastrous cutting down of the Royal Air Force. Britain must in future rule the air as she has always ruled the sea.

Topics of the Day

Let Us Be Honest

"Passenger Nerves" and the Future of Air Travel : The Delusion of "Air Mindedness" : The Typical Reactions of the Typical Person : Ignorance is NOT Bliss —— Facing the Facts

APART altogether from inevitable economic and technical difficulties which will be met when building up the post-war world's air services, I wonder how much thought is being given to the individual passenger's point of view. It is taken for granted that, provided the services are useful and reasonably cheap, "everybody" will travel by air when conditions merit it.

There are moments when I doubt it. Immediately after the last war there was a wave of interest in air travel, and even then it was assumed that within ten years aircraft would be as common and much-used as cars. During this war it is, as I have said, tacitly assumed that the passengers will be waiting so long as technical, economic and political difficulties have been cleared up to permit air travel to be within the reach of nearly everyone.

Now, of all the expressions in the world I dislike most that of "air-mindedness." A mere prejudice, perhaps, but the prejudice is based on an instinctive feeling that the expression is used by the wrong people with quite the wrong ideas. Most people know the difference nowadays between a Lancaster and a Mosquito, and most people, too, have rather more than an academic interest in aircraft and in problems concerning aircraft; but this doesn't mean to say that they are all prospective air travellers. Nor is it necessarily any good to push air travel down people's throats and to advertise it right and left by various direct and indirect means.

I know lots of men and women who are deeply interested in aircraft development and, indeed, who are taking a big part in this development, but who are psychologically—or even physically—averse to the idea of flying. Among these people are many who firmly believe in the future of the air, yet who do not propose to use it themselves unless they are forced to do so for very good practical reasons. Yet they are quite happy in the belief that everyone else will dash merrily about the sky. Why they should be so confident, I can't imagine.

Vertigo

Speaking even as one of the enthusiasts, I still see no reason to believe that everyone—or even the majority—will take to the air, other things being equal, when peace conditions finally stabilise themselves. Most of the men and women who are flying regularly just now will have a rooted objection to *being* flown, and some of them will have had enough of flying to last them for the rest of their lives. Of the others, much the same proportion as usual will either never be induced into the air, or will try it once and hate it just as much as they expected to hate it. It takes more than a generation or two to alter people's instincts, and for millions of years height has meant danger to the human race.

Admittedly, there is no actual height sensation when flying—except to the imaginative or timid—but the feeling of ever-present danger is there, and it is no earthly use imagining that it doesn't exist or that we shall all be educated out of it before this war is over. Further (again speaking out of turn as an enthusiast), flying as a passenger can be the most crashingly boring method of transport that has ever been invented—unless the aircraft is flying over interesting country, unless the passenger can take a technical or semi-technical interest in the proceedings, and unless he just likes flying for its own sake.

I can see no point in evading or forgetting the facts, because on such facts, and the consequently proper re-educating of people, rests the real future of civil aviation.

There are people who just hate flying for some unexplained reason; there are people who are always sick when they travel by air; and there are otherwise quite brave and normal people who are desperately frightened by it. I know men who have proved their courage and endurance in other spheres and who even have a considerable array of medals to support this proof, who are hopelessly terrified of the air. These people will—because they are sensible and morally sound—use the air when it is proved, particularly in wartime, to be the quickest and best way of getting along to an important job. They may even consider that a few short hours of misery are balanced in credit against days of comparative but useless comfort. They may even choose to travel deliberately by air because they know they hate it or are afraid of it and are not going to allow such a miserable emotion to alter their lives or beat them into submission.

Aerial Timidity

It is sometimes very hard, indeed almost impossible, for the enthusiastic flying person to understand the make-up of those who only fly when they have to—or not at all. As one who is more naturally timid than most, it may be a little easier for me, and I never have any emotions when I am faced by a case of good, honest fright over an experience which, for the most part, leaves my nerves unaffected. I like flying and I am used to it, but I probably wouldn't like to be in a submarine or down a coal-mine; I would hate to have the responsibility of commanding a battle-cruiser in an action against the enemy; and, for that matter, I suffer agonies of imaginative fear when I am asked to address more than a score of people. So I can't find it in my heart to feel superior about people who have a phobia about flying, but who face other and much greater dangers with calmness and fortitude.

And if, at any time, I feel any sense of irritation over the psychologically earthbound, I try to remember two outstanding cases of men who have been magnificent in the sort of very real danger which would reduce me to a state of carefully disguised nervous pulp. One, before entering the Service, on ground duties did magnificent work in the height of the London blitzes. The other has proved his more than ordinary courage on quite a few battlefields, and still finds it necessary to fly. Though his otherwise normal reactions to this occasional experience would never be noticed by anyone else, he hates every minute in the air, but has a sufficiently considerable sense of humour both to be able to cover it quite adequately and to laugh loudly at himself for his "weakness."

Just in case there are still people who have neither sympathy nor understanding for men or women like these, I am going to quote from a letter received by a friend of mine from just such an "air-hater" with a sense of humour and sufficient guts to carry on for the sake of the war effort. He is probably one of the many people who, once the necessity of war no longer demands their place in the air, will refuse to go near an aircraft again. I am talking, of course, about the person who finds it necessary to fly as a passenger, and not to pilots and other members of an aircrew, who are volunteers and can reasonably be expected to have a "normal" attitude.

". . . The weather report was—to me—most unpropitious," he says, "and meant flying at between 1,000 and 2,000 on a

LET US BE HONEST

dog-leg in order to follow valleys and not bump into mist-laden hills. As you will realise from this, I spent the trip in the intimate company of terrors which were entirely of my own making (for I have no doubt it was all in the day's work to an experienced pilot). Certainly, we could see nothing ahead; it was quite clear to me that we should have to force-land; and I could think of nothing else but that this forced-landing would be plumb on top of some cathedral spire. I followed the route carefully on my map and was appalled to find that it simply was littered with cathedrals (all with spires) and began to agree with those who hold that the country is rather over-full of ecclesiastical architecture. However, it turned out ultimately that I was holding the map upside down and was travelling rapidly towards some point off the north coast of Ireland.

"Our objective achieved, I prepared to dismount, descend, get out, or whatever the correct expression is, over the starboard side with that nonchalance which it is so easy and pleasant to assume with 'dangers' behind one. But when I waved my foot as a sign to the A.C.H. that I wished to have it fitted into the step, he was nowhere to be seen. Hanging there in a gymnastic attitude, I bellowed for his assistance, only to be informed that the step was on the other side. I had then to climb ignominiously back and, turning round, try the other side, entangling my inter-com. about four times *en route* around the various unnecessary taps and protuberances placed there by a malignant manufacturer. I descended, a beaten, humbled and broken man, to earth amongst those who I had hoped to impress with a dashing and experienced arrival.

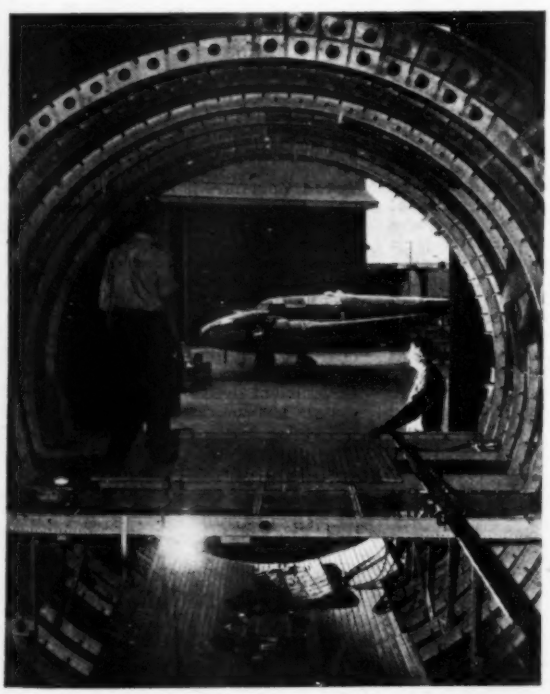
"We left again, with some promise of dirty weather ahead. It was evening, and I felt that a blanket under the aircraft would be a more than desirable place for the night, but, as nothing of the kind—or better—was suggested, I climbed in, hoping that the engine would refuse to start or a wing fall off before we actually got going. My wish wasn't granted and we took off 'without incident,' while I hoped this time that no fairy, beset with that impatient and reckless urge to grant wishes, had heard mine and was preparing, however belatedly, to carry them out.

"The smoothness of my passage laid my fears low, and I was happily pursuing my favourite occupation in the air—that of making quite sure, by comparing ground with map, that we were over where we most certainly were not—when I caught sight of some 'nasty weather ahead.' Jet-black and edged with several thousands of the most repulsive Gremlins I have ever seen. It was approaching us at 160 m.p.h.—our airspeed—and cathedral spires were forgotten as a few bumps left me with the absolute conviction that one-half of the aircraft would shortly break off and descend to the ground. A refinement of this profound belief was that I was also sure that it would be the half with me in it. In an endeavour to find out, in such an event, how far I should have to walk, I consulted the map. On comparison with ground features, I found that we were, apparently, approaching Southend. A minute later we three-pointed at our correct destination."

I shouldn't, of course, point out the obvious by remarking that most of this passenger's fears were quite groundless and were the result of lack of actual piloting experience—and possibly also of a subconscious belief that all pilots are nerveless and haywire and will fly on where angels fear to tread. But it is obviously a waste of good time to preach "airmindedness" and other rot to an intelligent person of this kind who knows and understands his weaknesses. Only the right kind of *knowledge* can save him.

For myself, I shall always travel by air if I can fly myself; I shall always do so if I can be allowed to take an intelligent hand in the proceedings and not just sit like a moron staring out on to a shiny metal wing; and I shall when it really saves time and energy, though I may be desperately bored during the few short hours. Between, say, London and any European capital the use of an airline saves the passenger an immense amount of physical and nervous energy; it is really too easy, and everything is done for one. It would almost be possible, with a good personal service, to be given a sleeping draught in a London hotel and to wake up again in the Adlon, Berlin—if that somewhat overpoweringly nineteenth-century hotel is still standing. If one's sole interest is in getting somewhere, whether Moscow or New York, flying is the obvious way to do it whether one is bored, frightened or anything else.

"INDICATOR."



LAST OF A LONG LINE: The final Hudson to be assembled at the Lockheed factory. It is framed by the fuselage of a Constellation transport now in production. The Hudson, which was a military adaptation of the Lockheed 14, has given wonderful service in the R.A.F., particularly with Coastal Command.

AUSTRALIA'S NEW FIGHTER

RECENT mention of the new Australian fighter, the Boomerang, has aroused considerable interest, but the censors will allow us to say very little about it at present.

All that may be disclosed at the moment of writing, in fact, is that it is a radial-engined, long-range single-seater, designed and produced in Australia, and is now in service with the R.A.A.F. in the S.W. Pacific theatre.

Whatever its performance and firepower may prove to be, its name should enhance its chances of returning to base.

A DIRECTOR ON LOAN

IT is interesting to learn from our contemporary, *Indian Aviation*, that the Government of India has loaned the services of Sir Frederick Tymms, Director of Civil Aviation, to Tata Aircraft, Ltd., of which he has becoming managing director.

This firm, which has begun the manufacture of aircraft at Bombay, is distinct from Tata Air Lines, though both are enterprises run by the Parsi family of Tata.

The civil airline started by this family has done splendid work on its run between Karachi and Madras.

A USEFUL SERVICE

ONE of the evils which war brings in its train is a continuous spate of new laws, rules and regulations. Some of them affect all of us, and all of them affect some of us, but the trouble is to keep track of them and, very often, to wrench their meaning from the tangle of legal verbiage in which they are so cunningly concealed.

Few business people have the time to spare for this sort of thing, but they must find it, somehow, unless they can get expert help.

And that is what *Butterworth's Emergency Legislation Service*, 37, Essex Street, Strand, London, W.C.2, sets out to provide; it keeps its subscribers up to date with every new emergency regulation that may affect them, and every one is annotated by an experienced legal staff, so that it can be readily understood by the layman. Since its fortnightly issues began in November, 1939, well over 6,000 "Orders" and more than 200 "Statutes" have been covered in this service.

Behind the Lines

Filling the Gaps

IT is reported from Bucharest that a number of men recruited from the Rumanian Air Force, and some civilian volunteers, are shortly to proceed to Germany where they will receive training as wireless operators and radio mechanics.

The Technical High School in Delft (Holland), which has a mechanical engineering and shipbuilding section, is now to train Dutchmen for the German aircraft industry. For this purpose it is reported that the Department of Education has added to the school a section for aeronautical science.

Air Transport

ACCORDING to latest information the *Lares* State-controlled Rumanian Air Transport Company operates at present air services radiating from Bucharest to the following places: Galatz-Odessa, Hermanstadt-Ard, Cernauti, Jassy-Kishenev, Craiova-Temeshburg, Budapest-Vienna-Berlin.

The German Way

A SOMEWHAT peculiar installation of the instrument panel is the subject of two German patents granted to the Henschel and the Arado Companies.

The object of the patents is to facilitate the pilot's concentration in dogfights and similar manœuvres and to prevent his being distracted by messages conveyed on the dials.

From the reported description of the patents it appears that for this purpose the instrument panel is no longer installed in front of the pilot but behind him or in the wing, and a kind of television device is employed to enable the pilot to read his instruments whenever necessary. In the Henschel patent the image of one or several of them is projected on a screen in front of the pilot, while in the Arado patent the windshield is employed for this purpose.

Jap Aircraft Output

ACCORDING to Rear-Admiral Dewitt Ramsey, Chief of the U.S. Naval Bureau of Aeronautics, Japanese aircraft production is 750 planes a month.

He said recently in Washington that the Japanese "show an ability to replace losses which is somewhat astounding," and that probably the productive capacity has been under-estimated.

Service and Industrial News from the Inside of Axis and Enemy-occupied Countries

Air Support

QUOTING a German estimate, a Spanish journal reports that Allied operations against Vichy were supported by 1,600 fighters, 650 twin-engined aircraft, 350 four-engined aircraft and over 800 different machines for special missions.

Payen Revived

ONE of the experimental types of aircraft on which work continued even after the French armistice is the Pa 22, originally designed by Payen for the Deutsch Cup. It is now reported that a prototype powered with a Regnier in-line engine of 180 h.p. is undergoing trial flights, after the completion of which two versions are to be developed: one as a 3-seater cabin machine, to be designated Pa 222, the other as a single-seater, open-cockpit type, named Pa 225.

The Payen is a wood constructed tandem monoplane, with characteristically swept-back wings; the front wings, of elliptical plan, have a slight dihedral and are "adjustable in flight" by a worm mechanism. The rear wings, of triangular plan without dihedral, have a relatively small span.

The construction of both wings features box spars with stiffened plywood leading edge, box-ribs with spruce bracing, and auxiliary spars of solid spruce.

The fuselage is of an oval section with vertical frames, flanges in spruce, and covered throughout with plywood. The pilot is seated in the rear section of the fuselage, while the dural fuel tank of 43 gall. capacity is placed in the centre of gravity. The oleo-undercarriage is braced to the underside of the fuselage.

The Payen has a span of 15.94ft., a length of 24.28ft., an empty weight of 1,179lb., and with two passengers (in the case of Pa 222), the flying weight is 1,995lb. Maximum speed is stated as 242 m.p.h., cruising speed 205 m.p.h., and landing speed 40 to 46 m.p.h. Normal flying range is 620 miles and ceiling 19,600ft.

Man-power

ACCORDING to a German report, a new satellite unit has been added to the *Luftwaffe's* collection; a number of recruits from Estonia have now been formed into a separate formation, serving with the German Air Force but wearing the Estonian national insignia.

Score

A DUTCHMAN who recently escaped from Holland revealed that after a particularly heavy raid on Cologne, an unknown person wrote on the wall of a ruined house in Rotterdam the following football score:

Rotterdam 1
Cologne 1

Meditation

"IN *Luftwaffe* circles," writes a German correspondent, "there is no inclination to consider pessimistically the development of the air war in the coming winter. The difficulties of weather are expected to limit the operations, and the main question asked is whether the Allies have enough trained and experienced crews to cope with the demands of night operations under adverse weather conditions.

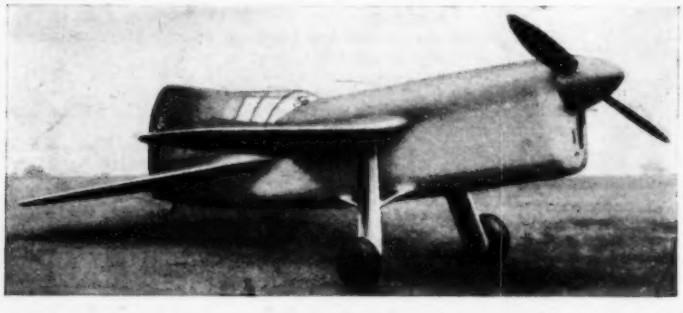
"On these factors," he adds, "will it depend whether Germany shall experience a bombing winter or whether a quiet period will again set in."

Despite this reliance on weather, it is said that the day will come when "we shall see what German industry has developed and tested during the time when the terror raiders were devastating our *Gaue*."

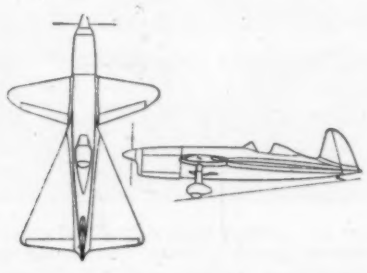
From Japan

HOW ruthlessly the Japs are trying to increase their war production may be seen from the recent decree of the Toyko Government abolishing all regulations limiting working hours and leaving the matter to the arbitrary decisions of individual employers.

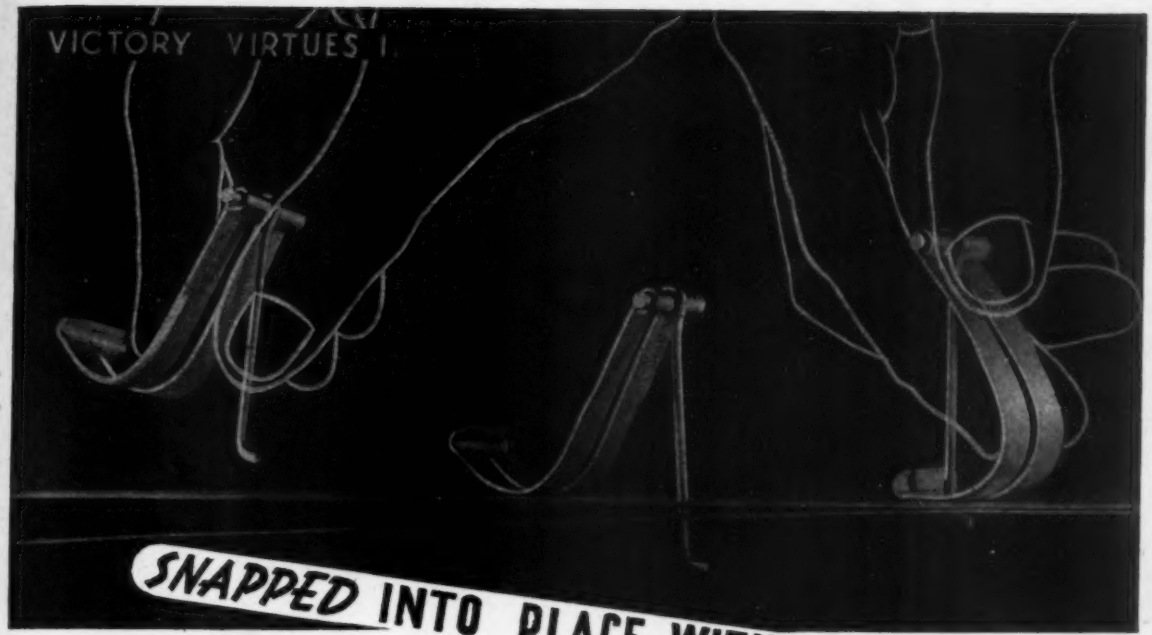
From the wide discussion of the issue in the Japanese Press it appears that even in the land of the Rising Sun it has not met with popular approval. The *Asahi*—one of the leading newspapers—observes that numerous factories have reduced their working hours despite the Government decree and their production output has increased as a result by 40 per cent.



The Payen Pa 222 carries two passengers and has a flying weight of 1,995lb. It is estimated to have a maximum speed of 242 m.p.h.



The Pa 225 is the single-seater open cockpit development of the prototype designed for the Deutsch Cup.



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MESSERSCHMITT Me 323

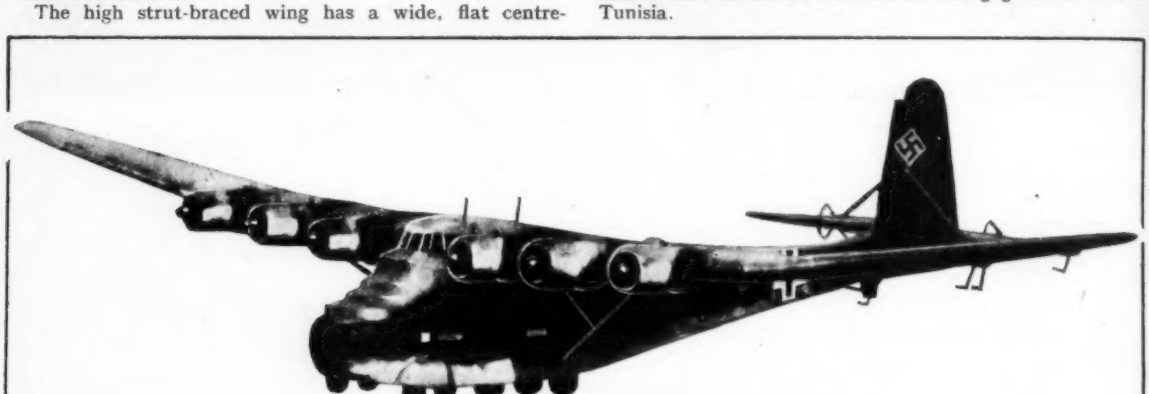
STARTING life as the Me 321 glider transport, of which it is a development, the Messerschmitt Me 323 six-engined transport is certainly one of the most interesting aircraft of the present war. Designed to carry about 100 troops or 20,000 lb. in freight for moderate distances, it can accommodate as many as 130 fully armed and equipped men or 26,000 lb. by cutting down its range to comparatively short distances, and its top speed has been variously estimated at from 150 to 170 m.p.h.

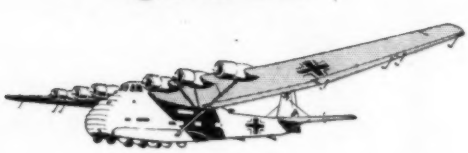
Cruising speed is probably just over 100 m.p.h. with full load and the range about 700 miles.

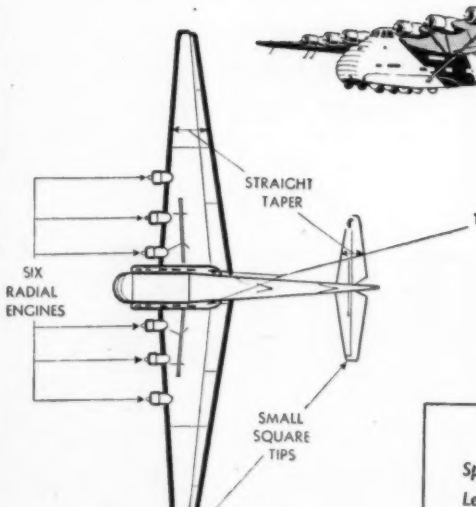
Certainly the queerest thing about this monster is its ten-wheeled undercarriage comprising six main wheels and four smaller front wheels which only touch the ground during landing, or when loading and unloading operations bring weight to bear on the nose. This, by the way, is split vertically, each half being hinged to swing open sideways to admit such bulky articles as small motor lorries and 88 mm. *flak* guns—typical loads known to have been carried to Tunisia.

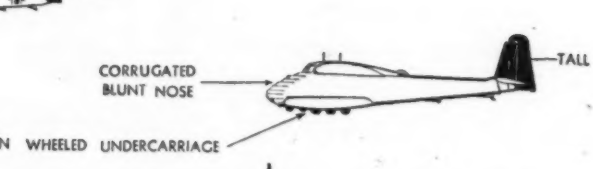
The high strut-braced wing has a wide, flat centre-section of sufficient cross-section at the roots to house a flight engineer's cabin on each side in the leading-edge, while within the main spar, on the port side of the fuselage, is the radio-operator's cabin. This main spar is of steel tube construction, but most of the ribs are of wood. The flat centre-section is entirely covered with plywood, but the tapered outer panels, set at a dihedral angle, are plywood covered back to the main spar and fabric covered aft of it. The fuselage has its main structure in large diameter welded steel tubes, but the freight floor is carried on massive girders. Fabric covering over wooden stringers conform to a rectangular section throughout its length.

The six French-built Gnome-Rhone 14N air-cooled radial engines are fully supercharged and have a maximum output each of 950 h.p. at 12,200ft., giving a total of 5,700 h.p. The power-loading is, therefore, very high and, together with a high D/L ratio, is responsible for the aircraft's mediocre performance. Provision is made, in fact, for rocket-assisted take-off, and quick-release towing attachments were found on at least one Me 323 abandoned in Tunisia.









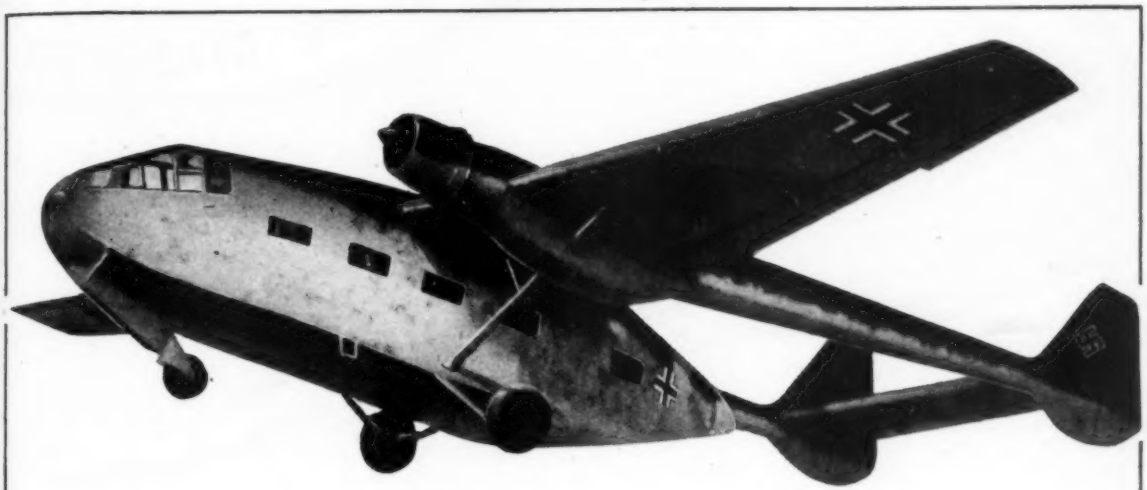
DIMENSIONS

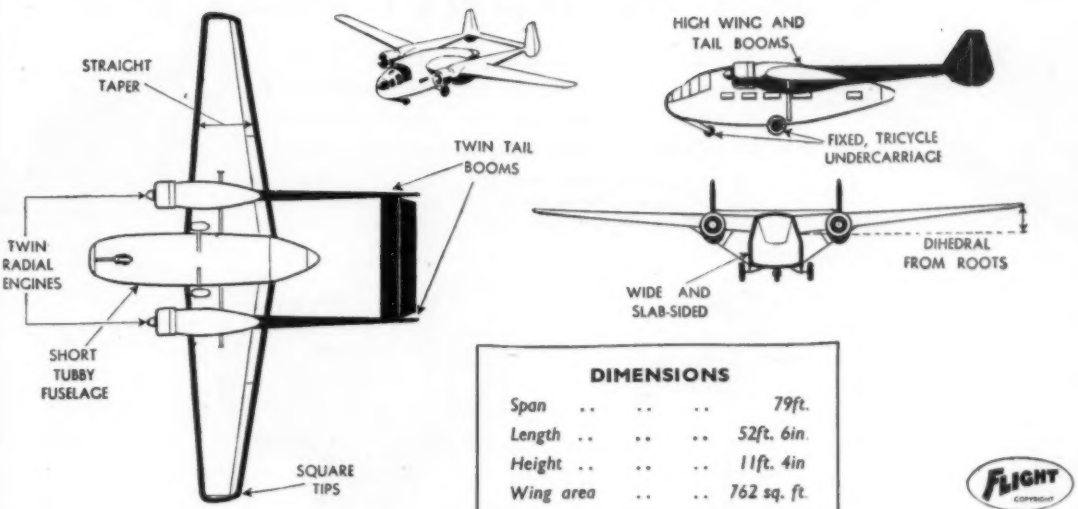
Span	*181ft.*
Length	*93ft. 6in.*
Height	*24ft.*
Wing area	*2 700 sq. ft*

FLIGHT COPYRIGHT

...heir Characteristics

GOTHA Go 244





DIMENSIONS

Span	*79ft.*
Length	*52ft. 6in.*
Height	*11ft. 4in*
Wing area	*762 sq. ft.*

FLIGHT COPYRIGHT

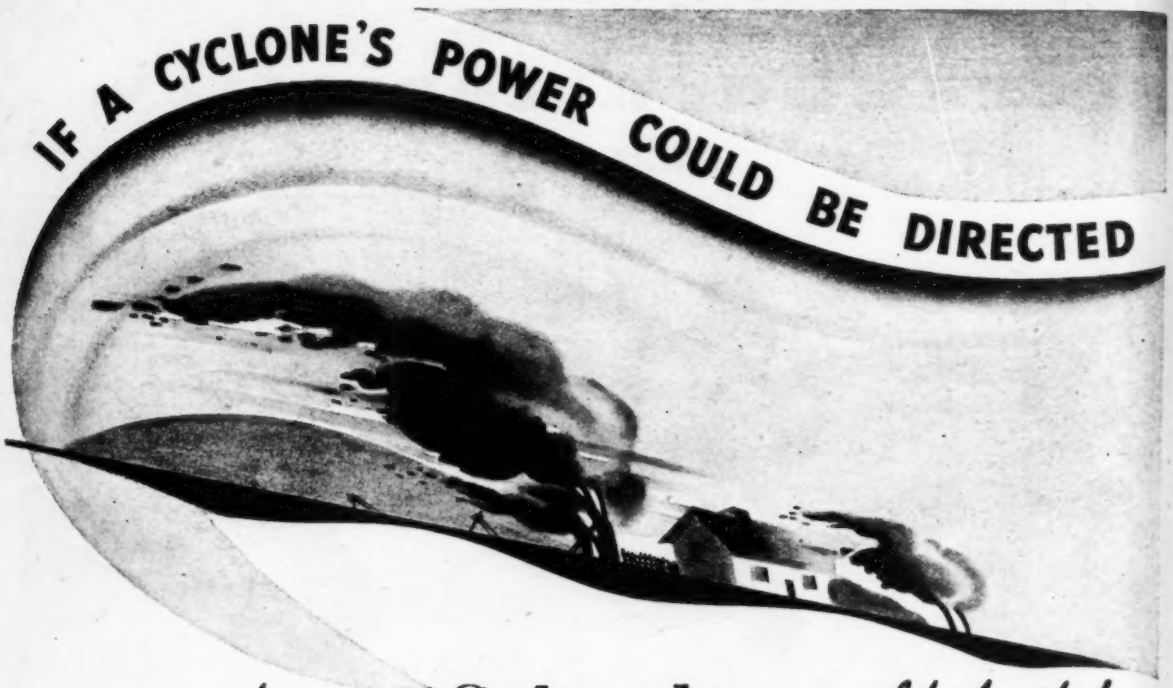
ANOTHER German transport glider which has "grown" engines is the Gotha Go 242, which thus becomes the Go 244. Like the Me 323, the power-units employed are French-built Gnome-Rhone 14 cylinder air-cooled radials, and while the first examples of the Go 244 were believed to have engines of the 14M type, developing a maximum output of some 700 h.p. each, it is probable that later versions have the fully blown 14N series with a maximum output of 950 h.p.

Apart from the necessary provision of a permanent undercarriage in place of the jettisonable wheels and fixed skids of its glider parent, the Go 244 has not undergone any visible alteration to its airframe, though it can be taken for granted that a certain amount of stiffening up must have been done to cope with the stresses incurred by the addition of engines to an aircraft originally intended for towed and gliding flight.

As will be seen from the accompanying illustrations, the twin radials are carried in nacelles which form a forward extension of the original tail booms which formerly began at the main spar of the wing, and in this respect the design of the glider lent itself readily to the addition of power-units. The central nacelle (one can hardly call this stubby body a fuselage!) has been designed with maximum storage space as the ruling factor, though some slight concession to aerodynamic form has been made by a bluntly rounded nose and a short tapered tail. A feature of the design is that the tail end of the nacelle hinges upwards to permit quick and ready access to the interior. This not only allows bulky items of freight, such as spare engines, etc., to be loaded and unloaded with ease, but when the aircraft is used for the conveyance of airborne troops, they can get in and (more importantly) out with the minimum delay. The low tricycle undercarriage is, of course, another great advantage in this respect.

The fuselage is built up of steel tubes, but the rest of the airframe is entirely of wood. Two pilots, having dual controls, sit side-by-side, and while defensive armament consists basically of four movable machine guns, any troops carried can use their rifles and tommy guns through the side windows, though their accuracy of aim is not likely to trouble the Allied fighter pilot very much.

IF A CYCLONE'S POWER COULD BE DIRECTED



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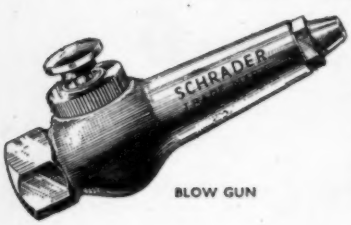

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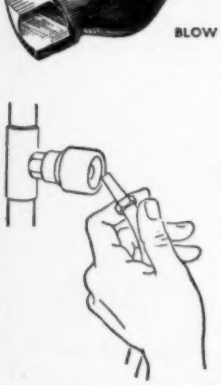

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Airscrews

A Review of the Present Position and Future Outlook of Constant-speed Airscrews

By L. G. FAIRHURST, A.M.I.Mech.E.
(Chief Engineer, Rotol Airscrews, Ltd.)

THE following article is mainly intended to review the present position and future development of the constant-speed airscrew, which has been found an essential fitment to all aircraft used in the present war, and also to review the demands of the later aircraft and future progress.

Method of Operation

In order to keep in mind during the reading of this article the functioning of a constant-speed airscrew, a brief description of its operation may be valuable to those who are not in constant touch with its use.

The constant-speed airscrew is controlled by an engine-driven governor, which holds the engine at any desired r.p.m. by controlling the pitch of the blades. The desired r.p.m. is obtained by the pilot's control lever, which in effect compresses or relieves the main spring in the governor unit according to the desired r.p.m. at which the governor is required to operate. Once set, the r.p.m. will remain constant, and the most efficient combinations of r.p.m. and boost for the different operational conditions of flight can be obtained.

Mr. L. G. Fairhurst, author of this article.

Additional to the constant-speeding feature, airscrews for multi-engined machines have facilities for "feathering" whereby the blades can be moved into the position where their leading edges are "edge on" to the air stream, and in which position the airscrew does not rotate. This feature prevents any further damage by preventing a windmilling airscrew "churning up" the engine. In the feathered position the drag on the aircraft is so much reduced that height can be maintained on a single engine for a much longer period than would otherwise be the case.

The 3-blader Position

As almost all aircraft are now designed around the variable-pitch airscrew, it becomes essential to obtain the maximum possible efficiency out of the airscrew, as the performance of a machine can be very easily marred by an inefficient airscrew blade.

The leading British fighters are all equipped with 35-deg.-range constant-speed airscrews, while the bombers have the extended range to permit feathering. The 35-deg.-range has been proved sufficient to cover all conditions of constant-speed operation of both fighter and bomber airscrews. On later airscrews for flying boats, the range of blade angle is now being extended to permit running in negative pitch for manœuvrability on the water. How far this "reversing" feature will be extended for use as an air-brake for night fighters and dive-bombers, or a landing brake for bombers, is at the moment unknown, but development will, no doubt, go ahead on these lines.

Until comparatively recently the majority of airscrews in use were of the three-bladed type, as engine powers of 1,200 h.p. at 20,000ft. rated altitude could be conveniently handled by three-bladers, providing there was no serious restriction on the diameter by reason of a short undercarriage, or in the case of bombers by fuselage/tip clearance.

As all fighter and bomber aircraft used up to the present in the war have rated altitudes around 20,000ft., the three-blader has sufficed to cover the various operational conditions demanded. In certain special instances it has been found necessary to use blades with wider chords than normal in order to obtain increased take-off and climb performance, but this usually reacts in a reduction in top speed.

The Introduction of 4-bladers

With the introduction of two-stage superchargers, having the effect of maintaining the engine power at much higher rated altitudes, combined with higher top speeds of aircraft, it has become essential to introduce four-bladed airscrews. This step has become necessary on account of the limitation on diameter which is imposed, due to it being necessary for optimum airscrew efficiency to keep the helical speed of the airscrew tip within a certain percentage of the speed of sound at the particular altitude. Airscrew diameter is also additionally limited in certain installations by reason of undercarriage length, and in the case of bombers, as pointed out above, fuselage clearance to the airscrew tips.

The extension of the usefulness of the three-blader has been considered by increasing the blade chordal width in order to provide the requisite increase in blade area, but this, as pointed out earlier in the article, loses efficiency at top speed, which can be ill afforded on modern fighters and bombers. Operating at an increased angle of attack on the airscrew blade would also extend the usefulness of the three-blader, but under modern conditions of operation this angle would reach such a high value that the blade sections would develop high drag and considerably reduce airscrew efficiency.

In view of these limitations it is necessary to introduce a fourth blade, the addition of which gives the airscrew sufficient blade area or "solidity" to handle the power at the limited diameter under conditions of reduced air density, allowing the blades to operate at an efficient angle of attack and using normal chordal widths of blade sections.

To assist in understanding this point an actual example can be quoted of an 11ft. airscrew on an aircraft of 350 m.p.h. with a rated altitude of 20,000ft. The helical speed of the airscrew tip under these conditions is 94 per cent. of the speed of sound. If the rated altitude of the machine is increased to 28,000ft., this percentage becomes 97. At relative tip speeds of this order a considerable reduction in efficiency occurs, due to compressibility losses, i.e., increased drag of the aerofoil section of the airscrew blade due to formation of shock waves. To get back to the original figure the airscrew diameter has to be reduced to delay the formation of shock waves, but this reduces the blade area to such an extent that it becomes insufficient efficiently to absorb the engine power. The obvious alternative, therefore, is the addition of a fourth blade at the reduced diameter. If the airscrew rotational speed were reduced, still maintaining the original diameter, this would delay the formation of shock waves, but a loss in efficiency would occur on climb and cruising.

A Rotol two-bladed full-feathering airscrew with large spinner.

Four-bladers have also been used for other reasons, namely, for improving take-off of heavily loaded bombers and fleet fighters, where in the latter case take-off space on the aircraft carrier is limited.

The use of wooden blades in these airscrews gives a most valuable saving in weight. In fighter applications the saving is as much as 80 lb. on the airscrew, and 40-50 lb. reduction in tail ballast which, when totalled, gives quite a useful contribution to climb performance around 30,000ft.

The requirement for four-bladed airscrews has been fully appreciated by the British airscrew manufacturers for some time, and this early anticipation has enabled the full development programmes to be carried out in good time for production to be available to meet the demands of the engine and aircraft manufacturers.

It is known that with the increase in number of blades on a single hub, energy losses due to rotational swirl of the slip-stream are present.

Forms of Vibration

It is also thought that vibration troubles will be encountered due to the effect of reactionless modes of vibration which appear with multi-blades in one plane. This form of vibration is aerodynamically excited and can occur with four or more blades in a single airscrew, but not in a three-blader, and has the peculiarity that the blades vibrate in such a manner that there is no reaction present at the airscrew shaft tending to displace the shaft either laterally or torsionally. Since the vibration is contained entirely in the airscrew itself, no advantage can, therefore, be taken of any inherent damping or energy dissipation which may be present in the engine system. Hence it has been thought that resonance of this mode of vibration would cause excessively high stresses in the blades. This reasoning has, so far as four-bladed airscrew experience is concerned, been proved unfounded, probably on account of the extra damping which is introduced by the additional number of blade root fixings. Further, it appears from recent experience that the aerodynamic forces which tend

to excite this form of vibration are small compared with other sources of excitation. It may be, however, that numbers of blades beyond four in a single hub will require more careful consideration of this inherent vibration.

Contra-props

When the 1,600-2,000 h.p. class of engine in fighter aircraft with rated altitudes of 28,000ft. upwards is introduced, the four-bladed airscrew becomes "under bladed" and cannot efficiently absorb the power at altitude. The climb and cruising performance also suffer considerably on account of "under blading."

The next stage to meet these conditions is the six-blade contra-rotating airscrew, which gives the required solidity for climb and cruising with good top speed efficiency and at the same time provides additional features in the way of cancellation of gyroscopic effects on engine mounting and airframe, and elimination of torque reaction, thereby preventing undesirable swing of the machine at take-off, and also reduction in energy dissipated in rotational slip stream, which energy appears as useful thrust and improves efficiency.

Development work carried out on constant-speed airscrews of this type indicates that technically this is the next step, as the additional advantages outlined in the last paragraph make it a very attractive feature.

This involves extensive development work associated not only with an airscrew of this type but also in the special twin-shafted reduction gear required on the engine, together with machine modifications to make full use of the features afforded.

The contra-rotating airscrew will again emphasise the necessity for light weight, especially since it is quite conceivable that if engine powers reach the 2,500-3,000 h.p. mark they will have to be equipped with eight blades, i.e., four per bank.

Intensive work on wood blade design is going on to give performance equal to the metal blade by reducing aerofoil

The Rotol three-bladed constant-speed airscrew is used extensively on British fighters and bombers.

section thicknesses and cleaning up the blade roots to improve the airflow over the spinner.

Valuable experience on the aerodynamic side has already been carried out on wooden-bladed four-bladers referred to earlier in the article, and as regards constructional features of such an airscrew the experience obtained with the operating mechanism requirements for single-hub four-bladers does not suggest any major difficulties.

Two-speed Engine Reduction Gears

With the increase of power at altitude, serious consideration has been given in the past to the use of two-speed engine reduction gears. The principle consists of two ratios, one derived to give correct helical tip speed of the airscrew relative to the speed of sound at rated altitude, and the other a higher ratio to give an increase in r.p.m. during take-off and climb. At a certain stage in the climb the gear is changed from its take-off ratio to the top-speed ratio, thereby permitting the airscrew to work at maximum efficiency under both conditions.

In the case of the bomber of the twin engine 2,000 h.p., 300 m.p.h. class there is little to choose between the use of a four-blader against a "four-blader two-speed gear" on take-off, but on climb a "four-blader two-speed gear" will show an advantage.

For a single-seater fighter of the 2,000 h.p., 400 m.p.h. class there will be little to choose between a contra-prop and "four-blader two-speed gear" at take-off, and on climb at high altitude it is probable that the gain due to extra solidity of the contra-prop will be greater than that obtained with a two-speed gear, since the compressibility losses in using the high-speed gear for this condition may

The Rotol contra-prop represents a class of airscrew which is very desirable for aircraft of the 1,600 h.p.-2,000 h.p. class with rated altitudes of 28,000ft. upwards.

be excessive. This, however, is a subject on which a considerable amount can be written, as each type of aircraft requires individual consideration, but these few remarks are merely intended to give some idea of the advantage which would accrue with a two-speed gear against which the added complication of producing a gear of this type may be assessed.

Under wartime conditions, where it becomes essential for manufacturing reasons to decide whether the two-speed engine reduction gear or the contra-prop gear is the better proposition, the additional advantages accruing from the latter, such as reduction in swing, etc., as referred to earlier in the article, weigh the decision in its favour.

Airscrew Applications of the Future

In conclusion, it may be of interest to note that the use of constant-speed airscrews as a means of converting engine power into thrust will still be an efficient proposition for aircraft with 3,500 h.p. engines at 40,000ft. with forward speeds of 500 m.p.h. The obvious type would be the contra-rotating, with eight blades 12ft. 3in. diameter.

This type of airscrew would by no means be unduly heavy or impractical from the manufacturing aspect, and, to hazard a forecast, it should meet the requirements of high-performance, high-altitude aircraft over at least the next two years. It will most probably be an advantage to supply the airscrew in two hub sizes, one for the small airscrew diameter, single-seater fighter type of aircraft, and the other for the larger-diameter airscrew demanded by bombers and flying boats.

For speeds and powers beyond these conditions, intensive development of aerofoil section shapes is essential in order to maintain efficiency at higher rotational speeds. Further development in blade material will also be essential so as to keep down overall airscrew weight by using smaller blade root sizes with consequent smaller hubs.

The future application of the contra-prop is not only dictated by the high-performance aircraft, as two applications which could take advantage of its other attributes will

Four-bladed airscrews are desirable for use with two-stage superchargers. This picture shows a Rotol four-blader.

AIRSCREWS

most certainly appear. The first application is the fleet fighter, where the easier handling of such a machine by reason of the reduction in "swing" makes the contra-prop an invaluable asset in taking-off, and more so when coming in to land on the restricted space of an aircraft carrier.

The second application is in the amphibian type of aircraft, where the provision of six blades enables the diameter to be reduced to such an extent that the engine nacelle can be situated nearer to the water than has hitherto been possible with the normal airscrew. This reduction in height to the nacelle from the water enables a much more clean and manœuvrable machine to be designed, at the same time still keeping the airscrew tips sufficiently clear of the water to prevent damage by sea-spray during take-off, this being an obvious example of the machine being designed "around" the airscrew.

Fighter Escort

Carrying the Air War into Enemy Territory : Comparison of Types and Armament

LT.-COL. C. G. PETERSON, one-time pilot in the Eagle Squadron of the R.A.F., and now a group commander in the U.S. Army Eighth Air Force Fighter Command in Britain, was recently "at home" to the Press. He has had extensive experience of air war, from the Battle of Britain to the present attack on the *Luftwaffe*. For his exploits on operations he has been awarded the British Distinguished Service Order and Distinguished Flying Cross, and since transferring to the U.S.A.A.F. he has received the American Distinguished Service Cross, the Purple Heart and Air Medal. He has twice qualified for the Caterpillar and Goldfish Clubs, having baled out twice and landed in the sea on each occasion.

Lt. Col. Peterson, D.S.O., D.F.C.

It was not, Col. Peterson said, the fighter pilot's job to *tell* stories but to *create* the stories for the Press to tell. During the whole conference he "doodled" studiously on his notes and equally studiously avoided anything savouring of "line-shooting." In his opinion the day-and-night air attacks on targets in Northern France and Germany by the R.A.F. and U.S.A.A.F. constituted a major attack on the *Luftwaffe*. The Germans considered Western Europe to be the most important air front.

Turning to the subject of daylight penetration in depth, Col. Peterson observed that seven months ago it looked a much bigger job than it does now. At that time it certainly appeared that a force of bombers and fighters which attempted deep penetration was bound to be annihilated. This has been disproved. To use his own words, "I consider we have won a considerable victory in the last two months." Thunderbolts, he divulged, had escorted Fortresses as far as the south-east of Paris and also to the edge of the Ruhr. In the Paris raid the Thunderbolts destroyed no fewer than 17 enemy aircraft for the loss of one Thunderbolt. For the month of August the score was 87 aircraft destroyed, 14 probables and 35 damaged for a loss of 15 Thunderbolts and one pilot saved. The enemy aircraft shot down included Fw 190s, Me 110s and several Me 210s.

We asked Col. Peterson whether, in view of the outstanding success of the Fortresses in shooting down fighters, he could foresee the day when fighters would be unnecessary. His opinion was that there would always be a job for the fighters to do, if only to break up the enemy attacks before they got within shooting range. He did not agree that the fighter personnel concerned would be more usefully employed in crewing more Fortresses.

Since he had flown both types on operations, we asked Col. Peterson if he would compare the Spitfire and the Thunderbolt, both from the flying and the armament points of view. From the handling aspect, he said, there was nothing to choose between the two. Despite the much greater weight of the Thunderbolt, it was equal in manœuvrability to the Spitfire. He emphasised, however, that, in addition to being a high-altitude fighter, it had a much longer range than the Spitfire. As regards the armament, there were, of course, individual preferences for the 20mm. cannon or the 0.5in. machine guns, but both, he thought, were equally effective. Personally, he preferred the Thunderbolt arrangement.

Our final question to him dealt with the limiting of diving speeds at high altitudes because of compressibility effects, which usually manifest themselves in the form of tail trouble. He said that some trouble had been experienced with the Lightning but this did not apply to the Thunderbolt. It can therefore be presumed that the original tail troubles which the Republic company had with the XP 47 Thunderbolt prototype have now been overcome.

BOOK REVIEW

Not Peace, but a Sword. By Wing Cdr. R. P. M. Gibbs, D.S.O., D.S.C. Cassell and Co., Ltd. 10s. 6d. *net.*

THIS is an intensely personal book by an author who passed through Cranwell with the idea that the R.A.F. was a flying club rather than a fighting Service. He was a man who was nearly always discontented with his present lot, either looking back with regret on his last job (which he had not much liked when engaged on it), or looking forward to getting something else. This personal outlook on the Service has the advantage that the author tells his readers far more details which are interesting to know than many other writers contrive to do.

It is part of this subjective treatment of his subject that Wing Cdr. Gibbs is intensely critical of himself and his own performances. After each operation he discusses with his readers the reason for some failure, or comparative failure, and explains what he thinks he did wrong, either in flying his machine or in the tactics he employed. In fact, he almost contrives to give the impression that he was a fairly inefficient officer—an impression which is clearly contradicted by the initials after his name. "Duds" are not made Companions of the Distinguished Service Order.

Soon after leaving Cranwell the author was posted to Coastal Command, rather to his annoyance, and then found himself in the Fleet Air Arm, to his intense disgust. Ultimately he got into a torpedo-bomber squadron, and, having learnt all about torpedo attacks with Swordfish (single-engined biplanes), he had to start again and learn about Beauforts (twin-engined monoplanes). He found the latter very different from the former to fly, and the whole scheme of tactics had to be altered and evolved anew. He boasts that it was his squadron which set up the new standards.

Of the Beauforts he wrote: "They were wonderful aircraft with fine engines, and we loved them," but he also said that they were probably more difficult to fly than most types in the R.A.F. One must always fly a Beaufort; never let it fly you. Torpedoes he found to be very tricky weapons, and it was all too easy to miss with them.

Once, in hospital, he met a number of night-bomber pilots, who could not understand his preference for daylight operations—for he disliked flying by night. He liked day and lots of cloud cover. There are many types of pilot in the R.A.F., and this book gives a graphic picture of one type.

German Aircraft Structures

Trends in the Design of Tail Units, Control Surfaces, Engine Mountings and Undercarriages : Item Weights of Representative Types

THE first instalment of this article, published in last week's issue, dealt with typical German fuselage and wing structures. The present article continues the examination made on behalf of the Ministry of Aircraft Production with details of secondary structures.

TAIL Units:—An interesting method of construction is used in the Messerschmitt types for the fin and tailplane. These components are constructed in two pressed half-shells, the leading and trailing-edge members as well as the main spar and ribs being split along the chordal plane. When the components are assembled the two halves of the spar and ribs are joined by bolts and nuts inserted through holes in the outer skin. The holes are subsequently covered by fabric patches. The leading and trailing edges, being still accessible, are then joined by rivets. The assembly is finished off at the leading edge by a half-round section secured by screws. The scheme is illustrated in Fig. 9.

The method of stiffening the otherwise unsupported side panels of the fin in the Fw 190 has already been described. In this machine the fin houses the tail wheel unit when retracted.

In all the German types except the Me 210 and He 111 the incidence of the tailplane is variable in flight by means of either a mechanically or electrically operated screw jack acting on the leading edge. Even on the Me 210 and the He 111 the incidence can be adjusted during maintenance.

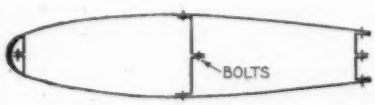


FIG. 9

Tailplane section.

Fabric-covered control surfaces are used on the four fighter types, metal-covered surfaces on the remainder. All control surfaces are mass balanced; either by external bob weights, as on the Me 210 ailerons; by leading-edge weights, as in the Fw 190 ailerons; by weights in the horn balance, as in the Fw 190 elevators and rudder; by inset balance weights, as in the Me 110 elevators; or by external weights housed in hoops passing through the fixed surface, as in the Do 217 elevators.

Flaps:—The construction of the Fw 190 flaps is interesting. Split flaps are used with piano-type hinges. Each flap is built up from three components comprising the flat sheet-metal lower surface; the Z-section spar; and the third component which, like the others, extends the full length of the flap and consists of a pressing so shaped that forward of the spar it completes the torsion box and behind the spar is cut out and bent over to form twelve ribs, as shown in Fig. 10. The finished flap is very strong and light, as well as being easy to produce.

Control Circuits:—In nearly all the German aircraft push-pull rods are used in the control circuits. The Me 109, Me 110 and Fw 190, however, employ solid-drawn 3-mm. duplicated steel wires in the rudder and elevator circuits. Self-aligning ball bearings are used in all the various bell crank levers and operating levers. All the trimming controls are operated by ⅛in. to ¼in. diameter torsion tubes.

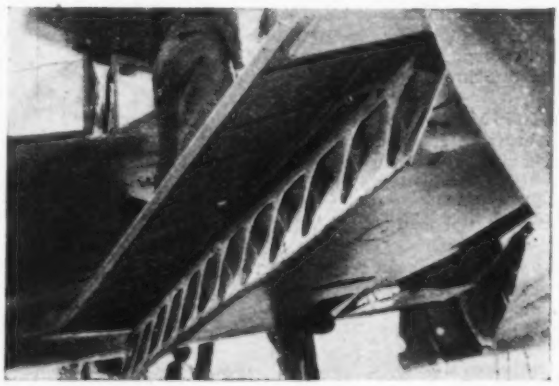


Fig. 10. Fw 190 landing flap.

Engine Mountings

Liquid-cooled:—The mountings for liquid-cooled engines in the majority of the German types are so similar as to be practically standardised. Except in the latest type employing a liquid-cooled engine, the Me 210, the mounting consists of two forged magnesium alloy bearers each supported in a horizontal attitude by a tubular strut with welded-on end fittings, or in the case of the Me 110, by a forged light alloy strut. The horizontal bearers are attached at their rear ends to fittings at the top of the engine bulkhead by ball joints through intermediate lugs of adjustable length. The supporting struts are pin-jointed to a point about halfway along each bearer, and at their lower ends they are

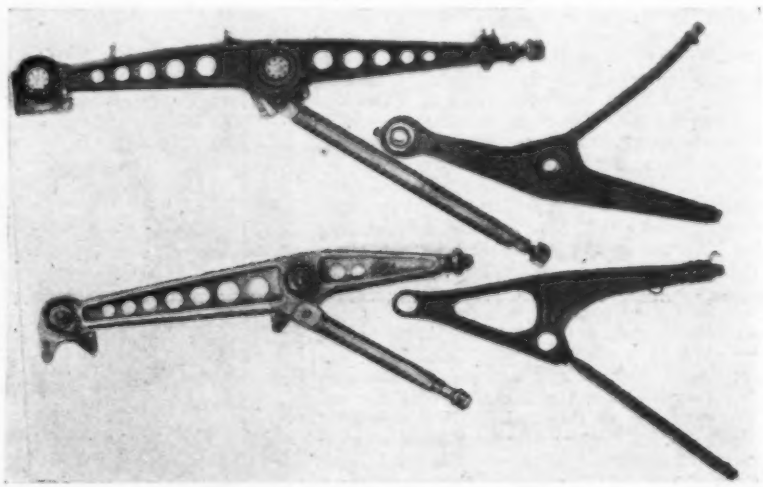
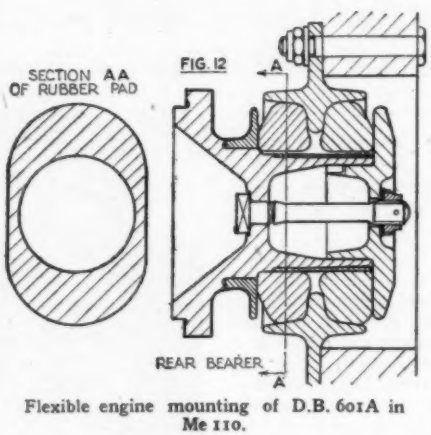


Fig. 11. German engine mountings. (Top left) Ju 88; (Top right) Me 210; (Bottom left) He 111; (Bottom right) Me 109.

GERMAN AIRCRAFT STRUCTURES

attached by ball joints to fittings at the bottom of the engine bulkhead. There is no connection between the two sides of the engine mounting except by their mutual attachment to the engine at two points on each side, one at the top of the engine about half-way along and one lower down towards the rear.

The Me 210 engine mountings differ from those described above in having the main bearers attached to the bottom of the engine bulkhead and sloping up towards the front of the engine, with tubular tie-rods attached to fittings at the top of the bulkhead to support the bearers in this position. Moreover, the bearers themselves are not magnesium forgings, but are each built up from a pair of hollow light-alloy stampings welded together to form rectangular-section members.



Flexible engine mounting of D.B. 601A in Me 110.

Fig. 11 shows four types of engine mountings for liquid-cooled engines, including the Me 210 type.

Radial:—In both the radial-engined machines, the Fw 190 and the Do 217, the engine mountings are of steel tubular welded construction. In the Fw 190 the design is novel in that the hexagonal mounting ring which is attached to the engine at ten points is of hollow welded construction, and forms a reservoir for hydraulic fluid.

Flexible Mountings:—In all these types of engine mountings the engine is carried by the bearers through the medium of flexible rubber bushes. Fig. 12 shows a section through a typical mounting bush, that used in the Me 110. The light alloy mounting boss is bolted rigidly to the engine and terminates in a journal. The thick lozenge-shaped rubber pads are pushed over the journal to form a saddle for the engine bearer. The rubber pads are held in place by a cap secured by a bolt through its centre to the mounting boss.

Undercarriages

A wide variation is apparent in the design of the undercarriages of German aircraft.

Fw 190:—The Fw 190 undercarriage is high and has a very wide track. Each wheel is carried at the end of a single long oleo-pneumatic shock absorber leg with a leather concertina cover over the exposed part of the piston, and triangular torsion links. The legs have a possible travel of nearly 15in. The top of each leg is in the form of a casting which incorporates a shaft, at right angles to the leg, which can rotate in two bearings, the front one in the main spar and the rear one carried about 1ft. farther back by two specially strengthened ribs. All the undercarriage drag loads are transmitted to the wing through these two bearings.

Each leg has a hinged side stay, made up of two light-alloy forgings, which breaks at the centre and is folded by an electric motor, working through a reduction gear box. The legs are drawn inwards and upwards by the side stays into wells in the underside of the wing. A photograph of this undercarriage is shown in Fig. 13. A compensating ram filled with air at 95 atmospheres works on the final drive shaft of the electric motor so that as it passes top dead centre in either direction the ram helps to ensure that the undercarriage goes right home in either the up or down position. Mechanical locks are provided in the retracted position but in the extended position locking is dependent on the end hinge points and the breaking hinge of the side stay being in line and held there by the ram.

The tail-wheel retraction mechanism is ingenious. The oleo leg is mounted with its piston at the top and the wheel is carried in a fork at the bottom of the cylinder. The lower end of the cylinder is carried at the end of a forked link pivoted to a point farther forward in the fuselage. The top of the oleo piston is fitted with a crosshead carrying two pairs of rollers which slide in a pair of vertical channels inside the fin, so shaped that in its lowest position the crosshead is turned over by a spring and is unable to slide up the channels. A cable passing over a series of pulleys connects the crosshead to one of the links in the starboard main undercarriage and when this cable is pulled the crosshead is rolled over into line with the channels and can then be drawn up. When the cable tension is relaxed a spring pulls the rollers down the channels and locks them in the lowest position. The tail wheel fork is rotatable through 360 deg. but is centred by a hairpin spring and can be locked centrally by a plunger operated by the elevator controls when the stick is pulled right back. The tail wheel retraction and locking mechanism is shown in Fig. 14.

Do 217:—In the Do 217 each of the two main wheels is carried in a twin oleo portal frame, braced by tubular members, which folds backwards into the engine nacelle. Raising and lowering of the undercarriage is accomplished by a 1 h.p. electric motor mounted on the back of the rear centre-section spar. Power from the motor is transmitted by a hollow shaft running transversely across the aircraft at each end of which is a pair of bevel gears driving a screw jack which moves the portal frame by a linkage. The tail wheel is carried in a cast fork and is retracted through an opening in the underside of the fuselage which is then closed by doors. The tail wheel unit is retracted by

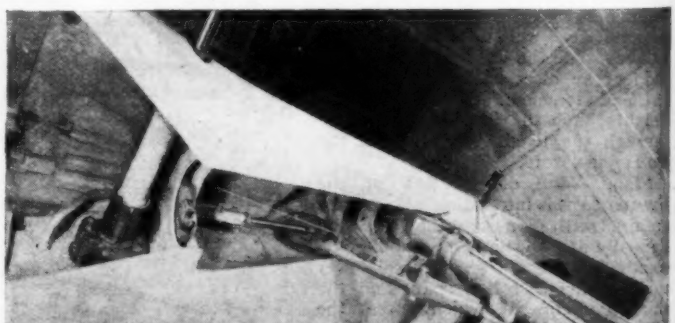


Fig. 13. Fw 190 main undercarriage.

GERMAN AIRCRAFT STRUCTURES

another screw jack driven from the same motor, which transmits power by means of a second shaft running down the side of the fuselage and driven by a bevel gear on the transverse shaft. The tail wheel is centred by elastic cords but there is no anti-shimmy damping.

Ju 88:—The Ju 88 undercarriage is the most unusual type of all those in use. Each of the two main undercarriage units comprises a semi-cantilever type shock absorber strut with wheel and tyre. The units are designed to retract rearwards into the engine nacelles and during retraction are rotated through 90 deg., so that the wheels lie flat against the underside of the wing when fully retracted. In each strut the shock-absorbing mechanism consists of two columns of steel "ring springs," operating in series. One of the columns operates also as a recoil buffer. The scheme is illustrated in Fig. 15. When the strut is compressed the outer ring of each part is expanded elastically and the inner ring contracted. Thus energy is mainly stored in straining the springs and is partly dissipated in friction between the conical surfaces.

Fig. 14. Fw 190 tail wheel retraction mechanism.

The tail wheel unit is self-centring and retractable and can be locked in the central position and incorporates a similar type of shock absorber. An interesting feature of these shock absorbers is the employment of steel compression springs of the "solid" ring type, as the energy-absorbing medium in both the main and tail wheel struts. In springs of this type the material will be stressed uniformly and therefore economically, and a large proportion of the energy absorbed by the springs may be dissipated in friction between the sliding conical surfaces of the rings. This type of shock absorber requires little maintenance work in service and is less susceptible to damage than an oleo-pneumatic shock absorber. The "ring spring" type is, however, rather heavier than an oleo-pneumatic strut of the same energy-absorbing capacity. In the latest marks of Ju 88 this type of leg, however, has been abandoned in favour of an oleo leg.

Me 210:—The Me 210 uses oleo-pneumatic shock absorbers on the main wheels. The legs are arranged as in the Ju 88 to rotate through 90 deg. as they are retracted rearwards into the engine nacelles so that the wheels lie flat in the wings when fully retracted. The tail wheel has a "ring spring" shock absorber with additional hydraulic damping.

Weight Summary Do 217–1.	Weight (lb.).	Weight per cent. all up wt.
Wings with c/s fuselage	4,600	13.6
Fuselage	2,815	8.3
Tail unit	610	1.8
Main undercarriage	1,830	5.4
Tail wheel unit	135	0.4
Controls	600	1.8
Engine mounting, cowling and nacelles	900	2.7
TOTAL STRUCTURE	11,490	34.0
2x Engine and accessories	5,365	15.9
2x Airscrew and spinner	785	2.3
TOTAL POWER PLANT (excluding mounting and cowlings)	6,150	18.2
Fuel and oil tanks	1,550	4.6
Bare weight	19,190	56.7
Armour	400	1.2
Fixed equipment	900	2.7
Removable equipment	610	1.8
TOTAL EQUIPMENT	1,910	5.7
Crew and parachutes	800	2.4
Fuel (655 gal.)	4,700	13.9
Oil (88 gal.)	800	2.4
Bomb load (approximate)	6,400	18.9
ALL UP WEIGHT	33,800	

Miscellaneous Design Features

Castings and Welded Components:—It will have been apparent in reading the above paragraphs on undercarriages and engine mountings that the Germans are using castings and welded components for many important structural parts. Undercarriage and tail wheel castings in the Fw 190 and Do 217 have already been mentioned, as have the welded tubular supporting struts in the liquid-cooled engine mountings and the welded tubular engine mountings for radial engines. A selection of typical castings is shown in Figs. 16 and 17. Fig. 16A illustrates the steel bottom connecting piece between the axle (also seen in the photograph) and the shock absorber strut of a Ju 88. Fig 16B shows the cast-steel fitting, one of which is attached to each end of the front centre section I-beam in the Me 109.

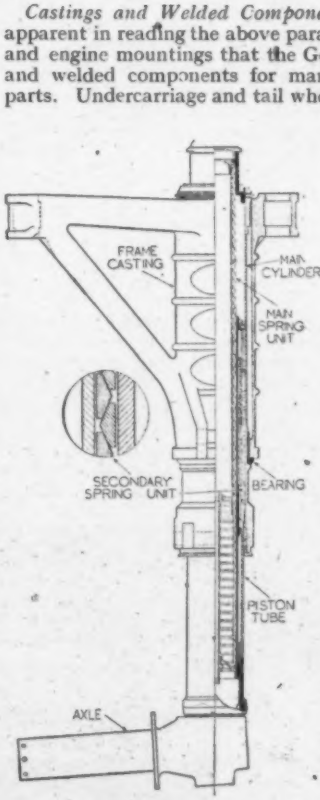


Fig. 15. Junkers Ju 88 undercarriage leg.

Each of these fittings carries the hinged lug which forms the front point of attachment for the wing unit, the pin joint of the undercarriage strut, the down locks for the undercarriage, the engine bearer supporting strut and a second strut which braces each of

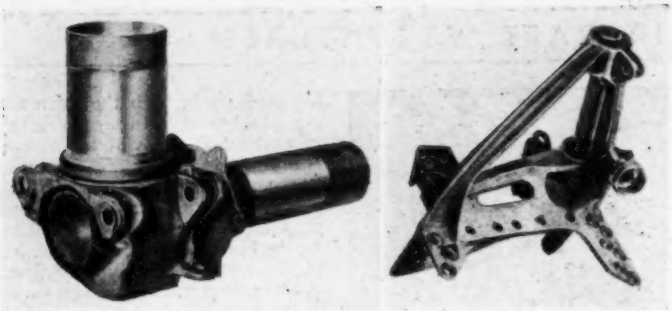
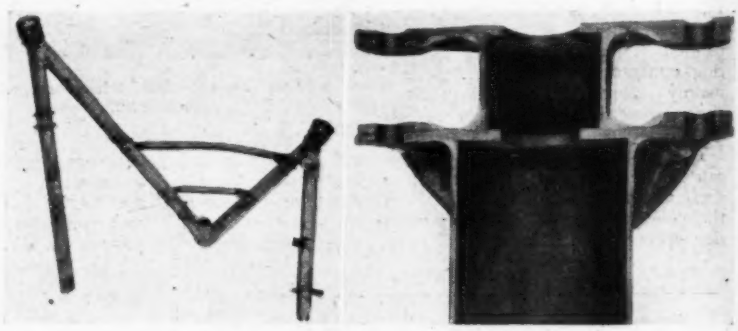


Fig. 16. A and B, typical castings.

GERMAN AIRCRAFT STRUCTURES

the cast fittings to the bottom boom of the main centre section spar. These two fittings are therefore the master parts of the aircraft. In landing they transmit the undercarriage loads direct to the fuselage and the engine also is directly braced to them. Fig. 17A shows the cast tail wheel fork of the Me 109. Figs. 17B and 17C show the top and bottom fittings respectively of the Me 109 main undercarriage leg. In this case the axle forms part of the bottom casting. Some typical welded components are shown in Figs. 18 and 19.

Fig. 18A illustrates part of the Do 217 engine mounting. All the joints between the main tubes of the mounting are welded. The tail-plane incidence adjustment crank, which takes a large proportion of the tail load in the Ju 88, comprises a welded steel assembly consisting of a tube, V-shaped strut and flanges. A cross-section at one end of the tube showing flanges welded to it is shown in Fig. 18B. Figs. 19A and 19B illustrate end fittings welded on to an Me 110 elevator control rod and a Ju 88 flap control tube respectively. The last two photographs illustrate two cross-sections at right angles at the bottom of the Me 110 tail wheel oleo showing the tail wheel fork welded to the bottom of the oleo piston. It will be seen that a steel plug has been welded inside the fork to provide a means of centring for machining. The fork itself is built up of welded sheet metal. The leg and fork combined have been heat-treated after assembly. Two vent holes are provided, and these have been filled up with weld metal after heat-treatment.



Figs. 18. A and B, typical welded components.

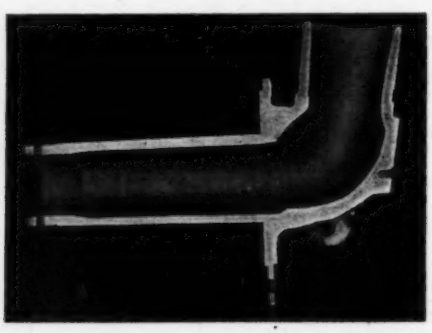


Fig. 17. A (top), B (left) and C (right), typical castings.

Plastics:—The use of plastic materials in German aircraft is limited to such items as guides for control wires; guide rollers for the large control tubes; pulley wheels; drive couplings for engine accessories; Ju 87 aerial mast; electrical and radio fittings, including trailing aerial winch drums.

Extrusions:—Extruded sections are used to a very limited extent, and then only of the simplest T-, L- or I-section, the best example being the Fw 190 in which the only extrusions used are the rails for adjustment of the pilot's seat. On other types of aircraft also extrusions are used only where the sections are too thick to be formed from strip. In this connection the lack of extruded sections is less marked in the Me 210, where they are used in the main plane and tail plane spar flanges, for the dive-brake slats, and for a number of structural members in the front fuselage as well as for some ingenious mounting slides for the multiple sockets used in the wing-to-fuselage electrical connections.

Miscellaneous:—Among other miscellaneous design features to be noted are the use of chordwise stiffeners only in the wings of the Do 217, Ju 88 and He 111, tending to produce a good airfoil section, the practice of making no connection between formers and stringers in the fuselage construction of nearly all types, the use of self-aligning plain bearings in engine-control systems, the generous use of self-aligning ball bearings in flying-control circuits, and the continued use of fabric-covered control surfaces in fighters. Protective treatment against corrosion is used to a small extent only.

Design for Ease of Production and Maintenance

Connection of Sub-assemblies:—Of all the German types the Messerschmitts seem to be in advance as regards design for ease of production and maintenance. The Messerschmitt type of construction of fuselage and fixed tail surfaces has already been described under those headings. Interchangeability troubles are avoided to a large extent by the methods used for the connection of sub-assemblies, which facilitate initial assembly and maintenance and, at the same time, render very accurate jigging unnecessary.

An example is the method of attachment of the wing to the fuselage in the Me 109. The wing is secured to the fuselage by pin joints at three points: one at each flange of the

GERMAN AIRCRAFT STRUCTURES

Weight Summary. Fw 190 A-3.	Weight (lb.).	Weight per cent. all up wt.
Wings	1,113	13.0
Fuselage	520	6.1
Tail Unit	150	1.7
Main undercarriage	480	5.6
Tail wheel unit	35	0.4
Controls	100	1.2
Engine mounting and cowling	250	2.9
TOTAL STRUCTURE	2,648	30.9
Engine and Accessories	2,680	31.2
Airscrew and spinner	390	4.5
TOTAL POWER PLANT (excluding Mounting and Cowling)	3,070	35.7
Fuel and oil tanks and systems	275	3.2
Bare weight	5,993	69.9
Radio	90	1.0
Oxygen equipment	25	0.3
Electrical gear	150	1.7
Instruments, etc.	100	1.2
Armour	150	1.7
Fixed armament accessories	100	1.2
Removable armament	816	9.5
TOTAL EQUIPMENT AND ARMAMENT	1,431	16.7
Pilot and parachute	200	2.3
Fuel (115 gal.)	860	10.0
Oil (10 gal.)	96	1.1
ALL-UP WEIGHT	8,580	

Weight Summary. Me 109 F-1/2.	Weight (lb.).	Weight per cent. all up wt.
Wings	748	12.4
Fuselage	742	12.3
Tail unit	80	1.3
Main undercarriage	240	4.0
Tail wheel unit	24	0.4
Controls	73	1.2
Engine mounting and cowling	146	2.4
TOTAL STRUCTURE	2,053	33.9
Engine and accessories	1,540	25.5
Radiators	150	2.5
Coolant	137	2.3
Airscrew and spinner	293	4.8
TOTAL POWER PLANT (excluding mounting and cowling)	2,120	35.0
Fuel and oil tanks	157	2.6
Bare weight	4,330	71.6
Radio	70	1.2
Armour	60	1.0
Fixed and removable equipment and electrical gear	302	5.0
Removable armament	335	5.5
TOTAL EQUIPMENT AND ARMAMENT	767	12.5
Pilot and parachute	200	3.3
Fuel (88 gal.)	680	11.2
Oil (8 gal.)	77	1.3
ALL-UP WEIGHT	6,054	

single spar and one farther forward close to the lower surface of the wing, the bolts lying in two axes at right angles, thus permitting generous assembly tolerances which are increased by the use of self-aligning bushes in the eye-lugs, a common feature in all German aircraft. Additional tolerance is catered for by the forward eye-lug, which is vertically adjustable on a facially serrated mounting in the wing.

The method of attachment of the rear fuselage and nose portions of the Do 217 to the centre section of the fuselage has been found by experience to be inconvenient for salvage and transport purposes due to the difficulty of access to many of the bolts, particularly in the rear fuselage where one is hampered by the large number of bracing members above the dividing deck. For the attachment of the outer wings, this method is more satisfactory, as access to all the bolts can be obtained by removing certain of the wing tanks.

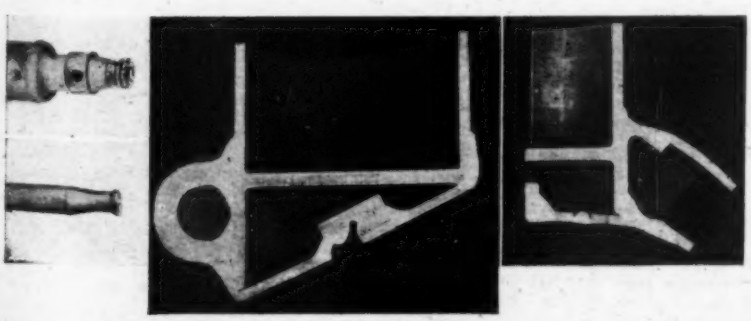


Fig. 19. A, B and C, typical welded components.

Engine Installation:—The arrangements for engine changing in all the German types are good, the installation being arranged always in the manner of a "power-egg," so that the engine, complete with accessories, mounting and cowling, can be removed from the machine as a single unit. The culmination of this scheme is seen in the Fw 190, in which the fuel and oil pipe connections are all brought to the edges of the bulkhead for ease of access. All disconnecting points, including the main engine mounting connections, electrical and pipe connections are painted red and white, and pipe connections are numbered so that the removal and replacement of an engine is a matter for comparatively unskilled labour. Removal and replacement of this engine can be accomplished in about four hours.

For minor maintenance work German engine installations are frequently not so convenient, and it has sometimes been found necessary to remove an engine for small maintenance jobs which, in other installations, would be undertaken with the engine in position.

Inspection Covers:—German aircraft are always well provided with quickly detachable inspection covers in the wings and fuselage, and there are always plenty of detachable panels of all sizes secured by screws. Most of the inspection covers can be released without tools by spring-loaded push-button fasteners. Engine cowlings are made quickly removable, and interchangeability is guaranteed by the type of fasteners used, the cowlings being drawn tightly into position as the fasteners are engaged.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

WHISPERING DEATH

Within Firing Range as Soon as Heard

REFERRING to "Hercules'" letter on the Beaufighter being named "Whispering Death" by the Japs, I think I can enlighten him a little.

Speaking from experience gained by living near an airfield where I see many "Beaus" I think "Hercules" will find that by the time he hears the roar of the Hercules engines he will find the Beau nearer to him than he expects.

In the event of a "Beau" attacking an objective, it would be well within firing range before it was heard.

A. TALBOT.

An Impressive Demonstrgtion

THE only way really to appreciate the Japs' name for Bristol's death-dealer—the truly terrifying Beaufighter—is to hear it first hand when diving to attack.

The other day I was present at an actual demonstration and stood on an airfield runway and had the really impressive experience of hearing as well as seeing a Beaufighter diving at me—straight at me—from over a thousand feet down to only some ten feet over my head. I need hardly add that by that time I was on my back and can testify to the peculiar whistling "whisper" which is unmistakable and can be associated with no other aircraft.

This curious sound seems to follow after the roar of the engines has been carried away by the terrific speed of the machine

W. G. CAIN.

"Wissshhh ! ! ! "

YOUR correspondent "Hercules" has raised a most interesting point in your issue of August 19th, as to why the Japs should call the Bristol Beaufighter "Whispering Death."

As all R.O.C. and spotters know, many aircraft have their own characteristic noise, which is often recognisable even when the aircraft cannot be seen.

A low-diving Beaufighter comes on you and is away again so quickly that the roar of the engines is over comparatively quickly also. The Hercules' exhaust roar dies away almost as soon as the aircraft has passed overhead, and there remains a long-drawn-out "wissshhh," which a Jap might mistake for a whisper if he survived the deathly stream of devastation from the cannon and guns. They will probably have stopped firing anyhow by the time the aircraft is overhead, so that only the characteristic sound will remain. "JUPITER."

A "Whispering" Approach

"HERCULES" has evidently not been approached from behind by a twin-engined aircraft flying at maximum speed at zero feet I believe it is under these conditions that the Beaufighter has been so aptly named "Whispering Death."

If "Hercules" is ever subjected to this experience, he will find that the first thing one hears is a sound not unlike a whispering noise, in fact whispering is a very apt description of the sound, which instantly swells to a terrific threshing noise as the aircraft passes overhead. It is not until the aircraft is overhead and has passed on that the exhaust noise can be plainly heard.

In the case of the Japanese and the Beaufighters, if the pilot spots his target while still some distance from it, and he opens fire, in all probability the projectiles will arrive at their destination at the same time, if not before, the aircraft is heard, and the psychological effect on the Japs must be pretty devastating.

The fact that very little noise is heard until the aircraft is almost overhead would be even more pronounced when flying over densely wooded country, as the trees, etc., would tend to blanket the noise. Also, flying up-wind would be even more advantageous.

Isn't it a fact that the noise made by the airscrews and stripstream is greater than that made by the engines at low level?

G. P. JONES.

Gas Turbines and Jet Propulsion for Aircraft
By G. GEOFFREY SMITH, M.B.E.
A second edition of the above booklet is now available from "Flight" publishing offices. The new work consists of ten chapters and includes many illustrations. Price 3/6 plus 3d. post.

THEORY OF FLIGHT

Queries on Prolonging the Flight

MANY pilots would like to know the answer to this conundrum.

When an aircraft has had its engine, or engines, put out of action, is it any use jettisoning as much weight as possible in order to prolong the glide?

It would seem the immediate reaction would be to say "Yes. The lighter the aircraft at such a time, the farther it would glide." But considering a simple statement of facts it would appear that this is not the case.

Suppose θ to be the angle of glide, θ is purely dependent on the L/D ratio, i.e., $\tan \theta = D/L$. The better the L/D ratio the smaller θ becomes.

Perhaps the argument is that with less weight to be carried, less lift would be required. This is correct, but makes no difference because, assuming that the aircraft is gliding at the angle of attack which produces the best L/D, then any lessening of the angle of attack will decrease the value of L/D—i.e., increase D/L and so θ.

Can anyone state, for the benefit of thousands of pilots, whether jettisoning a load really will increase the distance our aircraft can glide?

And here is a further sideline on the same problem: Would lowering the flaps, say, 10 degrees, prolong the glide? Apparently, the answer to that one is "Yes." But I wonder!

PILOT, R.A.F.

AIRCRAFT PRODUCTION, 1943

Replacement of Worn Parts

YOUR Editorial in the August 26th issue of *Flight* interested me in the matter of aircraft production. Having studied the mass production and individual production systems for the manufacture of machinery, here are my views.

First, the word "bottleneck" always seems to me to be a misleading term for use by technicians, as its ambiguity transfers the readers' thoughts from aeronautical affairs to the wine and spirit merchant's store. In *Flight* the word "shortage" would appear to be more appropriate.

Secondly, the question of an adequate supply of spare parts for a given machine, whether it be in mass production or in individual production, should present no difficulty to an engineer in charge of the work, because the designer of an aircraft should have a very fair idea of which component parts are liable to excessive wear and tear or fracture, and therefore need periodical replacement. In mass production the standardisation of such parts liable to excessive depreciation is a *sine qua non* for the approved design. In individual production the comparatively slow rate of production gives time for suitable spares to be provided in accordance with the specification of the approved design.

It should not be necessary to operate aircraft for lengthy periods before deciding which parts depreciate at a rate which requires periodical renewal. The data at the disposal of the designer should give a very good idea as to which parts require replacements, and enable a list to be included in the specification when it is submitted for approval prior to issue to the contractors and sub-contractors.

The Committee Report stated: "firms tended to concentrate on design; ease of production and efficiency in methods were regarded as of secondary importance." The designer is the one to concentrate on design, and when a design is submitted for approval, such approval should depend upon the design being practical and capable of being efficiently and easily produced by the means available to the contracting manufacturers.

It is realised that the aeronautical industry in Great Britain could not be organised on such a scale as to compete with the largest mass producers in America, because of the difficulty of obtaining raw materials economically and in sufficient quantities even if the experienced technical operators were available in sufficient numbers.

This fact, however, should not prevent the British aeronautical industry from manufacturing specialised types of aircraft on a lesser scale numerically, but of the quality which has always in the past been associated with machinery "Made in England"—i.e., a quality second to none.

W. REGINALD DAINTY
(Hon. Capt, R.A.F. (R.N.), Ret.).

NATIONAL DAY OF PRAYER : The Rev. J. H. Jackson conducting the service at an Air Transport Auxiliary Station.

SERVICE AVIATION

Royal Air Force and Fleet Air Arm News and Announcements

THE KING has been graciously pleased to approve the following awards in recognition of gallantry displayed in flying operations against the enemy :—

Distinguished Service Order

Act. Sqn. Ldr. J. W. ALLAN, R.A.F.V.R., No. 256 Sqn.—As pilot and observer respectively, these officers have displayed exceptional skill in recent operations over Sicily. One night in July, 1943, they destroyed two enemy aircraft, while the following night they destroyed one more. Two nights later, during one sortie they shot down four Ju 88s and one Cant 1007. Again, on the following night, they destroyed two more hostile aircraft, and thus in three nights' operations obtained ten victories.

Bar to Distinguished Flying Cross

Act. Sqn. Ldr. E. E. RODLEY, D.F.C., R.A.F.V.R., No. 97 Sqn.—Since being awarded the D.F.C., this officer has taken part in very many sorties, and throughout has made every endeavour to press home his attacks with accuracy and vigour. On one occasion he took part in an attack on Friedrichshafen. In spite of heavy and concentrated anti-aircraft fire, Sqn. Ldr. Rodley accomplished his task successfully. On the way to North Africa, en route from the target, an explosion occurred in the aircraft, causing much damage. Nevertheless, Sqn. Ldr. Rodley accomplished the journey and safely landed his damaged aircraft.

Flt. Lt. J. H. J. SAUVAGE, D.F.C., No. 97 Sqn.—This officer has taken part in a large number of operations. In June, 1943, Flt. Lt. Sauvage participated in an operation against Friedrichshafen. Whilst over the target area his aircraft was extensively damaged by fire from the ground defences, but he flew on to North Africa as planned and made a safe landing at an airfield there.

Act. Flt. Lt. C. GOSLING, D.F.C., R.C.A.F., No. 229 Sqn.—This officer has taken part in a very large number of sorties in the Middle East. In recent operations over Sicily he has fought with great skill and determination and, within a short period has shot down five enemy aircraft. He has destroyed nine hostile aircraft.

Act. Sqn. Ldr. V. C. MCAULEY, D.F.C., R.C.A.F., No. 7 Sqn.—In air operations this officer and airman have displayed courage and fortitude of the highest order

Act. Wing Cdr. R. D. SPEARE, D.F.C., R.A.F.O., No. 460 (R.A.A.F.) Sqn.—Wing Cdr Speare has completed a large number of operational sorties, many of which were against the enemy's most heavily defended targets, including Berlin. At all times he has displayed excellent airmanship, performing his duties as flight commander in an efficient manner.

Act. Sqn. Ldr. J. H. LELAND, D.F.C., No. 57 Sqn.—Sqn. Ldr. Leland, now on his second tour of operational duty, has completed a very large number of sorties. As a flight commander his attention to serviceability and maintenance of aircraft, training and instruction of new crews have contributed much to the squadron's successes.

Distinguished Flying Cross

F/O. H. J. DAVIDSON, R.A.A.F., No. 256 Sqn.—For citation see Sqn. Ldr. Allan, D.S.O.
Act. Wing Cdr. J. A. A. READ, R.A.F.O., No. 108 Sqn.
Sqn. Ldr. E. R. MEADS, R.A.F.V.R., No. 252 Sqn.
Act. Sqn. Ldr. J. M. CHECKETTS, R.N.Z.A.F., No. 485 (N.Z.) Sqn.
Act. Sqn. Ldr. A. INGLE, A.F.C., R.A.F.V.R., No. 609 Sqn.
Act. Flt. Lt. J. C. MORTON, R.A.F.V.R., No. 466 (R.A.A.F.) Sqn.
Act. Flt. Lt. R. S. PERKS, R.N.Z.A.F., No. 76 Sqn.
Act. Flt. Lt. R. A. READ, R.A.F.V.R., No. 78 Sqn.
Act. Flt. Lt. O. B. ROBERTSON, No. 97 Sqn.
F/O. F. S. FOYSTON, R.C.A.F., No. 252 Sqn.
F/O. G. TURNER, R.C.A.F., No. 75 (N.Z.) Sqn.
F/O. G. WHITE, R.N.Z.A.F., No. 126 Sqn.
Wing Cdr. H. R. COVENTRY, No. 102 Sqn.
Wing Cdr. D. C. SMITH, R.A.F.O., No. 76 Sqn
Act. Wing Cdr. J. H. GILES, No. 90 Sqn.
Act. Sqn. Ldr. K. D. BAIRD, R.A.A.F., No. 460 (R.A.A.F.) Sqn.
Act. Sqn. Ldr. H. W. CONNOLLY, R.A.A.F.
Act. Sqn. Ldr. C. H. EARTHROWL, R.A.F.V.R., No. 427 (R.C.A.F.) Sqn.
Act. Sqn. Ldr. B. E. HARRISS, R.A.F.V.R., No. 408 (R.C.A.F.) Sqn.
Act. Sqn. Ldr. P. A. HAGGARTY, No. 35 Sqn.
Act. Sqn. Ldr. J. B. MILLWARD, R.C.A.F., No. 426 (R.C.A.F.) Sqn.
Act. Sqn. Ldr. R. J. NEAL, No. 78 Sqn.
Act. Sqn. Ldr. W. F. M. NEWSON, R.C.A.F., No. 408 (R.C.A.F.) Sqn.
Act. Sqn. Ldr. A. S. RAPHAEL, R.A.F.V.R., No. 467 (R.A.A.F.) Sqn.
Act. Sqn. Ldr. R. C. SMYLIE, D.F.M., R.A.F.V.R., No. 158 Sqn.
Flt. Lt. H. M. ASHTON, R.A.F.V.R., No. 76 Sqn.
Flt. Lt. A. J. A. DAY, R.A.A.F., No. 57 Sqn.
Flt. Lt. K. H. W. DODKIN, No. 138 Sqn.
Flt. Lt. C. W. INGHAM, R.A.F.V.R., No. 61 Sqn.
Flt. Lt. D. H. MURPHY, R.A.F.V.R., No. 100 Sqn.
Flt. Lt. W. C. NEATH, R.A.F.V.R., No. 61 Sqn.
Act. Flt. Lt. E. S. BAKER, R.C.A.F., No. 7 Sqn.
Act. Flt. Lt. M. B. BENNETT, R.A.F.V.R., No. 72 Sqn.
Act. Flt. Lt. A. G. BEVERIDGE, R.A.A.F., No. 78 Sqn.

THE growth of the R.A.F. and the increasing number of deeds of valour have proved too much for our supply of paper. With great regret we must omit citations for the awards of D.F.C. and D.F.M., but when a bar to either is awarded the original citation will be quoted where possible

Act. Flt. Lt. F. W. BROWN, R.A.F.V.R., No. 218 Sqn.
Act. Flt. Lt. E. W. CRANWELL, R.A.F.V.R., No. 102 Sqn.
Act. Flt. Lt. P. M. CUTTING, R.A.F.V.R., No. 97 Sqn.
Act. Flt. Lt. D. I. EVANS, R.A.F.V.R., No. 50 Sqn.
Act. Flt. Lt. F. W. FENNELL, R.A.F.V.R., No. 218 Sqn.
Act. Flt. Lt. R. D. FERGUSON, R.A.F.V.R., No. 35 Sqn.
Act. Flt. Lt. B. M. GILMOUR, R.N.Z.A.F., No. 50 Sqn.
Act. Flt. Lt. J. M. GREIG, R.A.F.V.R., No. 57 Sqn.
Act. Flt. Lt. G. HAWORTH, D.F.M., No. 207 Sqn.
Act. Flt. Lt. S. E. HARRISON, D.F.M., R.A.F.V.R., No. 619 Sqn.
Act. Flt. Lt. G. H. HARTLEY, R.A.F.V.R., No. 106 Sqn.
Act. Flt. Lt. R. P. HELLIS, R.A.F.V.R., No. 10 Sqn.
Act. Flt. Lt. G. F. H. INGRAM, R.A.F.V.R., No. 102 Sqn.
Act. Flt. Lt. J. E. B. JEFFERSON, R.A.F.V.R., No. 109 Sqn.
Act. Flt. Lt. P. KELLY, R.A.F.V.R., No. 49 Sqn.
Act. Flt. Lt. V. F. R. KENWARD, R.A.F.V.R., No. 76 Sqn.
Act. Flt. Lt. D. F. KING, R.A.F.V.R., No. 77 Sqn.
Act. Flt. Lt. F. E. KING, R.A.F.V.R., No. 102 Sqn.
Act. Flt. Lt. J. G. MCNEILL, No. 426 (R.C.A.F.) Sqn.
Act. Flt. Lt. W. A. MEYER, R.A.F.V.R., No. 9 Sqn.
Act. Flt. Lt. A. J. M. MILNE, R.A.F.V.R., No. 214 Sqn.
Act. Flt. Lt. D. C. MOON, No. 102 Sqn.

Conspicuous Gallantry Medal (Flying)

W/O. M. G. CLYNES, No. 431 (R.C.A.F.) Sqn.—This warrant officer has successfully completed a large number of operational sorties. He has taken part in attacks against Tripoli, Naples, Catania, Benghazi and other targets in the Middle East and North Africa. He has also attacked some of the most heavily defended targets in Germany. On four occasions his aircraft has been attacked by night fighters and each time he has successfully directed his captain's evasive action. During these combats he has destroyed at least two enemy aircraft.

Bar to Distinguished Flying Medal

Flt. Sgt. T. H. GOACHER, D.F.M., No. 619 Sqn.—Flt. Sgt. Goacher has taken part in a large number of operational sorties. On one occasion in June, 1943, he was the rear gunner in an aircraft detailed to attack Bochum. Before reaching the target his turret was damaged by enemy action, nevertheless this airman pressed on and successfully completed his mission.

Distinguished Flying Medal

Act. Flt. Sgt. F. K. NIGHTINGALE, No. 7 Sqn. For citation see Sqn. Ldr. McAuley, D.F.C. and bar.
Flt. Sgt. H. A. TAYLOR, No. 38 Sqn.
Sgt. J. A. PHILLIPS, No. 405 (R.C.A.F.) Sqn.
Sgt. M. E. PLAXTON, No. 178 Sqn.
Sgt. J. A. DEVINE, No. 97 Sqn.
Sgt. A. DRIVER, No. 10 Sqn.
Sgt. H. EARLE, No. 106 Sqn.
Sgt. J. B. EATOCK, No. 467 (R.A.A.F.) Sqn.
Sgt. R. F. ESCREET, No. 15 Sqn.
Sgt. (now P/O.) G. G. H. FARARA, No. 97 Sqn.
Sgt. G. P. FINNERTY, R.C.A.F., No. 115 Sqn.
Sgt. F. A. FORSTER, R.A.A.F., No. 106 Sqn.
Sgt. W. GABBOTT, No. 10 Sqn.

THE KING has been graciously pleased to approve the following awards:—

Military Cross

Act. Flt. Lt. R. G. K. THOMPSON, R.A.F.O.—During operations in Burma, in March, 1943, this officer displayed marked courage and initiative in the face of the enemy. In addition to his duties as the C.O. of the R.A.F. section of a column he took an active part in all engagements with the enemy, and was always to the fore with his Tommy-gun, steady and indifferent to his personal safety. His example had a marked effect on all ranks in the column, whilst his detailed knowledge of the enemy and their methods was of the greatest assistance to his superiors.

THE KING has been graciously pleased, on the advice of Canadian Ministers, to approve the following awards:—

George Medal

P/O J. F. WILLIAMS, R.C.A.F.
L.A/C. G. F. W. LYON, R.C.A.F.

B.E.M. (Mil.)

Sgt. J. S. HOYE, R.C.A.F.
Sgt. C. F. JOHNSON, R.N.Z.A.F.
Sgt. L. G. MATHEW, R.A.F.
Sgt. R. A. PICARD, R.C.A.F.
Sgt. J. A. TUNSTALL, R.A.F.
Cpl. O. R. DOBREE, R.C.A.F.
L.A/C. J. M. GILLIS, R.C.A.F.

Award of a Foreign Decoration

THE KING has granted unrestricted permission for the wearing of the undermentioned decoration, conferred upon the officer indicated, in recognition of valuable services rendered in connection with the war:—

Conferred by the President of the United States of America

Distinguished Flying Cross

Flt. Lt. W. R. B. WATSON, R.N.Z.A.F.

Roll of Honour

Casualty Communiqué No. 278.

THE Air Ministry regrets to announce the following casualties on various dates. The next of kin have been informed. Casualties "in action" are due to flying operations against the enemy; "on active service" includes ground casualties due to enemy action, non-operational flying casualties, fatal accidents and natural deaths.

Of the names in this list, 82 are second entries giving later information of casualties published in earlier lists

Royal Air Force

KILLED IN ACTION.—Sgt. W. T. Whiting.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. T. W. Balmforth; Sgt. H. Brown; Sgt. T. B. Bywaters; Flt. Sgt. R. Cameron; Sgt. L. G. Carr; Sgt. J. G. Cocks; Sqn. Ldr. R. N. Collins, D.F.C.; Sgt. J. Denny; Sgt. P. J. Donoghue; Sgt. N. Gorfunkle; Sgt. H. Gregson; Sgt. S. E. T. Harcourt; F/O. P. E. Helmore; Sgt. M. J. Howe; Sgt. E. H. Hulatt; Sgt. V. S. Marsh; Sgt. S. W. Nash; P/O. A. Pattison; Sgt. F. R. Pickering; Sgt. W. J. Sharpe; Sgt. E. L. Simon; W/O. J. G. Smith; Sgt. E. J. Stansfield; Sgt. R. Tebbutt; P/O. W. A. Tolmie.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. A. T. J. Barnicott; Sgt. J. A. Brogan; Sgt. W. G. Brown; P/O. R. Butler; F/O. A. J. Calvert; Sgt. S. F. Clark; F/O. H. P. Collings; P/O. J. B. Edwards; Flt. Sgt. A. K. Fish; F/O. P. F. W. Gales; Sgt. H. E. Goldsack; F/O K. C. Gundry; Sgt. J. W. Gunning; Sgt. A. F. Heffernan; Sgt. F. Hendron; Sgt. C. O. Howard; Sgt. R. Howat; Flt. Sgt. W. F. Keatley; Sgt. S. R. Lord; Sgt. V. Mackey; F/O. J. Marriner; F/O. J. T. M. Miles; Sgt. R. C. Morcock; Sgt. W. W. Morton; Sgt. A. C. Orr; Flt. Sgt. H. H. L. Pryce; Act. Sqn. Ldr. C. Raymond, D.F.C.; Flt. Sgt. H. E. Rousseau; Flt. Sgt. K. Rutherford; Sgt. H. B. Smith; Sgt. J. G. Taylor; Flt. Sgt. R. C. Taylor; Sgt. W. J. Wakelin; Sgt. J. H. Wilcox.

WOUNDED OR INJURED IN ACTION.—Sgt. J. Hall; Sgt. A. Rosen.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. E. Batty; Sgt. R. B. Cooper; Flt. Sgt. T. Ellis; Sgt. J. Glover; Act. Flt. Lt. D. A. Hine; P/O. R. E. Mercer; Sgt. J. Osborne; F/O. H. D. Quilter; Flt. Sgt. E. L. Reed; Sgt. E. Smith; Sgt. V. Sugden; Sgt. R. A. Waterhouse; Sgt. A. E. Wilkes.

MISSING.—Sgt. J. S. R. Ablett; Sgt. K. C. C. Adams; Sgt. R. G. Akers; Sgt. J. Anderson; Sgt. W. Anderson; Sgt. L. V. Anthony; Sgt. D. Armitage; F/O. J. B. G. Bailey, D.F.C.; Sgt. S. F. Barker; Sgt. A. T. Barlow; Sgt. H. R. Barnes; Flt. Sgt. S. J. Barnes; Sgt. J. F. Bates; F/O. J. Bell, D.F.M.; Sgt. T. H. Bell; P/O. P. E. Bevis; Sgt. W. Blackie; Sgt. W. S. Brooks; Sgt. R. Brown; Sgt. A. A. Caley; Sgt. L. R. Cant; Sgt. R. J. P. Chandler; Sgt. M. H. Clack; Sgt. A. Clarke; Sgt. T. W. Connor; Sgt. A. N. Cooper; Sgt. P. J. Court; Wing Cdr. J. Coverdale; Sgt. G. H. Cox; Sgt. J. D. Cresswell; Sgt. E. C. Crook; Sgt. W. G. T. Day; Sgt. C. W. Dixon; P/O. G. W. B. Enright; Sgt. S. A. Errington; Sgt. S. Fallows; Sgt. C. R. Fenwick; P/O. A. J. Fitchett; Sgt. J. B. Foskett; Flt. Sgt. J. S. Foster; Sgt. N. Fotheringham; Sgt. J. Garbutt; Sgt. J. C. Gardner; Sgt. F. Getting; Sgt. J. W. Gillard; Sgt. K. S. Gillard; Sgt. K. Gore; Sgt. D. A. H. Gough; Sgt. N. Graham; W/O. F. J. Haines; Sgt. R. Hammond; Sgt. E. T. Harding; Sgt. J. R. Hayle; Flt. Lt. W. J. Hein; Sgt. T. A. Hick; Sgt. J. A. Hitchins; P/O. A. E. Humphreys; Sgt. C. P. Johns; P/O. C. A. Johnson; Sgt. H. Jones; Sgt. T. Jones; Group Capt. R. C. Jordan; Sgt. T. E. Judd; Sgt. M. Kendlan; Sgt. G. Kipling; Sgt. E. W. Lane; Sgt. G. W. Lawson; F/O. J. E. Lewis; Sgt. J. Lindley; Sgt. L. D. Lingwood; Sgt. J. J. McDonald; F/O. J. N. MacKenzie; Sgt. P. C. McNair; Flt. Sgt. C. L. Mallett, D.F.M.; Flt. Sgt. J. A. Marsden; Sgt. J. M. Meech; Sgt. C. K. Miller; Sgt. T. Mitchell; Sgt. H. Naiman; Sgt. W. N. Nisbett; Sgt. M. E. Owens; P/O. G. C. W. Parslow, D.F.M.; Sgt. G. H. Peel; F/O. J. A. Perkins; Sgt. G. M. Phillips; Sgt. J. Picton; Sgt. J. S. Porter; Flt. Sgt. R. P. Reynolds; Sgt. E. Richards; Sgt. R. W. Ridgley; Flt. Sgt. J. A. Robson; Sgt. C. Sampson; Sgt. D. Sanders; Sgt. S. Seward; Flt. Sgt. K. R. W. Sheppard; Sgt. R. B. Simpson; Sgt. R. A. H. Smith; Sgt. D. R. Spanton; Flt. Sgt. J. M. Steel; Sgt. F. J. M. Steer; Sgt. R. W. Stevenson; Sgt. P. D. Stratton; Sgt. T. M. Sugden; Sgt. J. W. Sykes; Sgt. W. A. Taylor; Sgt. H. Taylorson; Sgt. W. I. Thomas; Sgt. A. Thompson; Flt. Sgt. E. A. Tipler; Sgt. M. P. Tobin; Sgt. E. D. Tuddenham; P/O. T. B. Tomkins; Sgt. A. G. Tovey; Sgt. A. Twohy; Sgt. P. A. G. Warwick; Flt. Lt. K. Webster; Sgt. S. G. White; Sgt. S. E. Williams; Sgt. J. E. Woodward; Sgt. J. H. Wright; Sqn. Ldr. A. M. Young.

KILLED ON ACTIVE SERVICE.—L.A/C. W. E. L. Evans; Flt. Sgt. F. Hutchinson; Sgt. T. Inglis; Flt. Sgt. C. Laycock; Sgt. J. D. D. Longden; Flt. Sgt. H. E. Thompson; L.A/C. D. J. Trump.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Sgt. C. W. Free; Sgt. E. A. Hooker; Sgt. F. L. James.

WOUNDED OR INJURED ON ACTIVE SERVICE.—L.A/C. N. Lister.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Flt. Sgt. C. F. Capel; W/O. R. D. Herapath.

DIED ON ACTIVE SERVICE.—L.A/C. L. D. Bland; L.A/C. S. Brough; L.A/C. E. J. Browning; L.A/C. C. R. Coopey; A/C.1 V. Courtney; L.A/C. H. Dyne; L.A/C. C. E. Harley; Sgt. W. H. Mason; L.A/C. P. T. Rafter; L.A/C. J. Scott; Sgt. P. D. Shorter; L.A/C. R. G. Thompson.

Women's Auxiliary Air Force

DIED ON ACTIVE SERVICE.—L.A/CW. K. M. Beare; A/CW.2 R. Hardcastle.

SERVICE AVIATION

Flt. Lt. D. F. King, of No. 77 Squadron, who has been awarded the Distinguished Flying Cross.

Royal Australian Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. L. G. Davis; F/O. W. Garriock.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. D. A. Donaldson; Sgt. M. G. Smart.

MISSING.—Sqn Ldr. J. R. Savage; Flt. Sgt. M. B. Watt.

KILLED ON ACTIVE SERVICE.—Flt. Sgt. P. E. Devine; F/O. B. Holmes A'Court.

Royal Canadian Air Force

KILLED IN ACTION.—Sgt. D. S. Béare; Sgt. P. H. Cashen; Sgt. E. H. Connell; Sgt. J. N. G. Finlayson; Sgt. K. A. M. Harker; Sgt. P. Illingworth; Sgt. W. D. Maconnell; Sgt. M. J. McDonald; Sgt. T. C. Mulligan.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—P/O. N. R. Chap; Flt. Sgt. A. G. Cumming; P/O. P. A. V. England.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. W. S. Bourke; Flt. Sgt. D. F. Burchell; Sgt. C. Collard; Sgt. F. B. Croke; Sgt. N. Davis; Sgt. E. C. Kehl; W/O. N. R. Learmouth; Flt. Sgt. D. D. Miller; Sgt. N. Raitblat; Flt. Sgt. J. H. G. Tasse.

MISSING.—Sgt. W. Andrews; P/O. R. J. Burke; P/O. J. K. D. Craigie; Sgt. M. R. Deverill; Sgt. A. W. Dickison; Sgt. H. S. Fawns; Flt. Sgt. B. S. Fudge; P/O. J. R. G. Gingras; Sgt. H. S. Hicks; Sgt. C. W. Keay; Sgt. D. E. Kenwell; Sgt. J. M. C. Legace; Flt. Sgt. G. L. Linklater; Flt. Sgt. R. McNeil; Sgt. J. J. C. Mercier; Sgt. N. R. Morrison; Sgt. R. E. Murdock; Flt. Sgt. L. F. O'Leary; Sgt. E. B. Peart; F/O. C. R. Thomas; Sgt G. L. Tucker.

KILLED ON ACTIVE SERVICE.—Sgt. D. H. Benson; Sgt. J. H. Brown.

DIED ON ACTIVE SERVICE.—L.A/C. J. Alexander; Sgt. J. L. Johnson.

Royal New Zealand Air Force

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—P/O. L. M. Mason.

MISSING.—Flt. Sgt. D. H. Northcoat; P/O. E. R. Strang.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Sgt. B. L. Garlick.

South African Air Force

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Lt. F. O. Noome.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—2/Lt. L. B. Leith.

Indian Air Force

WOUNDED OR INJURED ON ACTIVE SERVICE.—F/O. M. Y. Aziz.

Casualty Communiqué No. 279.

Of the names in this list 85 are second entries giving later information of casualties published in earlier lists.

Royal Air Force

KILLED IN ACTION.—Sgt. M. Bloomfield; Flt. Sgt. W. Bruce; Sgt. W. S. Buchanan; Sgt. K. R. Burrows; F/O. W. Derbyshire; Sgt. P. Donlevy; Sgt. L. W. Fisher; Sgt. J. Greenwood; Sgt. E. T. E. Jones; Sgt. A. E. Michaels; Sgt. S. E. Pegg; Sgt. D. M. M. Rice; Act. Flt. Lt. T. W. Savage; Sgt. N. C. Smith.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. J. Forbes; Sgt. W. J. Howes; Sgt. G. D. Leslie; Sgt. G. W. Rhodes; Sgt. G. Slater.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—F/O. E. M. W. Bolton; Sgt. D. Brierley; Sgt. R. A. Cherrington; Sgt. A. M. Craig; Sgt. G. Cunningham; Sgt. T. C. Dewar; Sgt. G. Fleck; Sgt. F. Gilder; Sgt. R. A. Giles; Sgt. J. Glaves; Sgt. E. W. Hargreaves; P/O. A. B. Hastings; Sgt. G. R. Haugh; Sgt. L. E. Herbert; P/O. P. W. Hewitt; Sgt. J. McArthur; Sgt. A. H. MacDonald; Sgt. W. B. McVicar; Sgt. W. C. Massey; Sgt. W. Moylan; Sqn. Ldr. R. N. Peace; D.F.C.; Sgt. C. R. Ray; Sgt. A. Roddam; Act. Flt. Lt. E. A. U. Smith; Sgt. E. I. Sofaer; Sgt. S. Spencer; Flt. Sgt. F. B. Thomas; Sgt. A. G. Tillett; Sgt. J. E. N. Warner; Sgt. J. H. Watling; Sgt. T. C. Westwood.

WOUNDED OR INJURED IN ACTION.—Sgt A. A. J. Hunt; Flt. Sgt. F. H. Mason.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—F/O. C. P. M. Phillips.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. A. Bailey; P/O. R. E. Bradshaw; Flt. Sgt. R. G. Gravett; Flt. Sgt. J. T. W. Jones; Sgt. H. Pape; F/O. H. H. Pearson; F/O. S. Peate; F/O. E. W. Skirrow; Sqn. Ldr. D. L. Wolfe, D.F.C.

MISSING.—L.A/C. E. Bagster; Sgt. W. Bell; Act. Flt. Lt. D. R. Bigg; P/O. W. R. Binnington; Sgt. G. S. Brodie; Sgt. W. Brown; Sgt. W. E. Broxup; Act. W/O. C. M. Colburn; Wing Cdr. H. R. Coventry; Sgt. H. Cox; Sqn. Ldr. A. P. Craigie, D.F.C.; Sgt. J. F. Croxall; P/O. W. Edmond; Sgt. J. Egleston; Sgt. S. G. Ellis; P/O. R. K. Francis; Sgt. W. V. Gerrard; Sgt. W. Hardy; Sgt. C. B. Hemmings; Sgt. F. J. Hobbs; Flt. Lt. G. F. Hogg; Act. Flt. Lt. F. E. King; Sgt. M. J. Maloney; Sgt. R. B. Minchin; Sgt. R. D. Moodie; Sgt. E. R. Norburn; Sgt. F. Oakley; Sgt. G. T. Pine-Coffin; Sgt. J. Quayle; F/O. C. F. Read; Sgt. E. H. Reader; Sgt. W. Robinson; F/O. H. T. Rothwell; Flt. Sgt. C. T. Rudman; Sgt. M. J. R. Ryan; W/O. A. G. Sadler; Sgt. A. Slack; Sgt.

SERVICE AVIATION

D. W. Sloggett; Sgt. W. A. Speller; P/O. A. C. Stephens; L.A/C. P. Stewart; Sgt. J. Streton; Sgt. R. M. Thomas; Sgt. R. V. Turner; P/O. S. H. C. Watts; Sgt. S. L. Webb; Act. Sqn. Ldr. B. S. Williams, D.F.C.; Flt. Sgt. B. B. Wood.

KILLED ON ACTIVE SERVICE.—Sgt. R. Alderton; Sgt. L. W. Bacon; F/O. G. R. Birnie; Sgt. W. E. Brister; Sgt. W. M. Coopey; Flt. Sgt. T. Corless; Sgt. R. N. Cowie; Sgt. E. A. Deacon; Sgt. M. G. Eastlake; L.A/C. C. S. Forster; Sgt. J. Godley; Sgt. F. C. Grievson; Air. Comdre. J. W. B. Grigson, D.S.O., D.F.C.; A/C.1 A. Haigh; L.A/C. A. B. Harris; Sgt. W. E. L. Harrison; Sgt. R. W. Hewitt; Sgt. F. G. Howard; Sgt. D. C. Hunt; F/O. G. B. King; Sgt. R. G. Lancelott; Sgt. C. A. Lane; Flt. Lt. J. Lewis, D.F.C.; P/O. D. Lister; Sgt. H. A. Lloyd; Flt. Sgt. R. Lodge; L.A/C. J. A. MacDonald; A/C.2 T. A. McLoughlin; Sgt. H. H. Patrick; Sgt. R. D. Peters; Sgt. T. Reid; Sgt. R. H. Richards; L.A/C. H. Rooney; Sgt. A. E. D. Ross; Flt. Sgt. S. Schragger; Sgt. H. J. Shallow; Sgt. W. Shearer; L.A/C. E. C. Sheppard; L.A/C. A. E. Taylor; F/O. E. Thomas; Sgt. D. M. Thomson; F/O. J. H. Tremear; Sgt. G. L. Turville; Sgt. A. M. Vinton; Sgt. J. D. MacD. Winton; Sgt. T. H. Woollard; Sgt. B. C. Young.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Cpl. E. K. Ford; Sgt. A. R. Mott.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. A. C. Croft; P/O. N. Harland; Sgt. J. McCandlish; Sgt. P. D. Probert; Act. Cpl. B. A. Williams.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—P/O. T. W. Jenkins; Sgt. G. H. Peck; Sgt. E. V. F. Weatherley.

DIED ON ACTIVE SERVICE.—L.A/C. L. W. Armstrong; L.A/C. R. H. Birch; Cpl. M. Casey; A/C.1 K. Cheney; L.A/C. T. E. Davies; A/C.1 J. Egan; Sgt. B. Jacques; A/C.1 D. E. W. Jempson; L.A/C. E. Nuttall; L.A/C. D. Parry; L.A/C. H. F. Pollard; L.A/C. J. R. Taylor; L.A/C. E. W. Tomlins; L.A/C. J. D. Williams; A/C.2 N. Yaffe.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—Sgt. J. A. Bell; P/O. R. C. W. Dennis; Sgt. J. Gale; Sgt. L. C. Minshaw.

Royal Australian Air Force

KILLED IN ACTION.—P/O. S. A. Chapman.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. P. Cocklington.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. G. G. Fraser; Sgt. R. V. Hall; P/O. W. G. Sharpe; Sgt. J. L. M. Thomson; Sgt. G. E. Twigg.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—F/O. E. J. Bertuch; Flt. Sgt. F. Parker.

MISSING, BELIEVED KILLED IN ACTION.—W/O. R. E. Mudie.

MISSING.—Flt. Sgt. A. Burton; Flt. Sgt. I. T. D. Carnie; Flt. Sgt. G. C. Colless; Flt. Sgt. G. K. Conroy; Flt. Sgt. D. A. Dunn; Sgt. E. O. Gregory; Sgt. J. Hennessy; P/O. R. J. Hudson; F/O. E. S. Murphy; Flt. Sgt. R. G. Petch.

KILLED ON ACTIVE SERVICE.—Flt. Sgt. C. F. Beitz; Flt. Sgt. R. H. Collis; Sgt. R. A. K. Dettman; Sgt. J. Weeden.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. E. T.-Shorter

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—Sgt. G. A. Downton.

Royal Canadian Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. R. G. Blair; Sgt. J. Forman; Sgt. S. Jenson; Sgt. J. A. Parker.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—P/O. C. E. Bell; Sgt. J. Fellows; Sgt. E. S. Green; F/O. W. C. Hamilton; Flt. Sgt. J. F. Streeting; Sgt. W. A. Wakeman; Sgt. H. G. Wilson; Sgt. D. A. White; Flt. Sgt. I. N. Yudell.

PREVIOUSLY REPORTED MISSING, NOW REPORTED DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—F/O. G. P. Waite.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. D. G. Bebensee, D.F.M.; Sgt. H. Erickson; F/O. G. G. McGladrey, D.F.C.; Flt. Lt. R. G. Morrison, D.F.C.; Sgt. P. L. Rakoczy; Sgt. J. G. Sweeney; P/O. E. M. Witt.

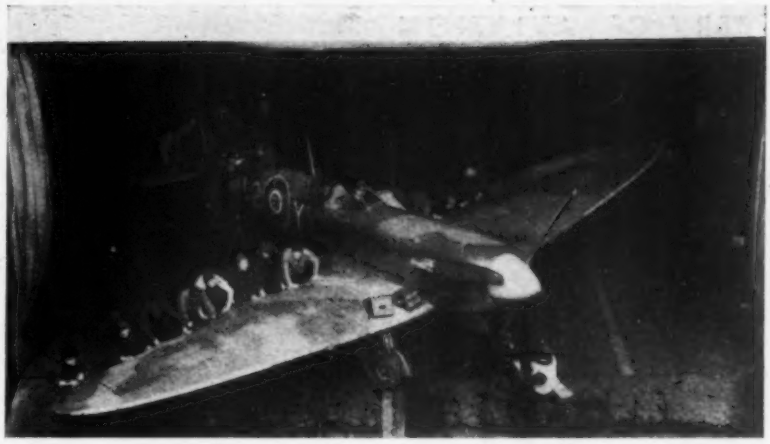
MISSING.—P/O. T. H. N. Emerson; F/O. R. O. E. Goodwin; P/O. F. W. Hodge; P/O. W. R. L. Horne; Sgt. J. B. Johnson; Flt. Lt. P. N. Jost, D.F.C.; P/O. J. H. T. J. Lemieux; P/O. R. A. Livingston; Flt. Sgt. J. Lowry; Sgt. A. R. Lutes; P/O. S. L. Murrell, D.F.C.; P/O. A. W. Nichols; Sgt. R. L. Robinson; Flt. Sgt. E. D. Rowe; Sgt. B. R. Riddell; F/O. J. R. Rumbel; P/O. J. A. Smith; Flt. Sgt. M. Trevale; Sgt. Z. Yonkers.

KILLED ON ACTIVE SERVICE.—Sgt. R. E. Atkinson; P/O. A. Drysdale; Sgt. K. P. Gemmel; Sgt. D. J. Gillies; Sgt. N. L. Glynn; F/O. H. Gulbraa.

Royal New Zealand Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. J. C. Brockett; Sgt. J. A. Fuller; Sgt. C. J. Kendal; Sgt. F. W. O'Sullivan.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—P/O. M. O. Clark; Sgt. E. G. Firth; Sgt. A. Martin; Sgt. L. H. Parkinson; Sgt. T. C. B. Pike; Sgt. H. W. Pullar; Sgt. M. A. Torrance; Sgt. V. Watters.



SILVER JUBILEE : Pushing a Seafire on to the lift of H.M.S. *Argus*. Now being used for training Fleet Air Arm pilots, H.M.S. *Argus* has completed 25 years service with the Royal Navy.

MISSING, BELIEVED KILLED IN ACTION.—P/O. N. B. Bluck; Flt. Sgt. G. W. Strong.

MISSING.—Flt. Sgt. S. R. Bisset; Flt. Sgt. A. W. A. Bruce; Flt. Sgt. J. B. Cooksey; Sgt. G. P. McBain; Flt. Sgt. R. G. Miles; Flt. Sgt. A. S. Roberts; Flt. Sgt. G. K. Samson; Flt. Sgt. R. T. Smit; Sgt. A. E. Watson.

DIED ON ACTIVE SERVICE.—Flt. Sgt. J. Anderson.

South African Air Force

KILLED IN ACTION.—Flt. Sgt. D. J. Perry.

MISSING, BELIEVED KILLED IN ACTION.—Lt. C. Batchelor; Lt. A. M. Hofmeyr; Flt. Sgt. W. K. Smook.

MISSING.—Lt. H. W. Nottingham.

KILLED ON ACTIVE SERVICE.—Flt. Lt. Hunt; Maj. G. J. Le Mesurier, D.F.C.

Casualty Communiqué No. 280.

Of the names in this list, 102 are second entries giving later information of casualties published in earlier lists

Royal Air Force

KILLED IN ACTION.—Act. Flt. Lt. P. H. Bell.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. D. Abberley; Sgt. W. J. A. Fleming; P/O. J. E. Forster; P/O. C. D. Hemy; Flt. Sgt. P. R. Herbert; Sgt. W. E. Hollowell; Sgt. R. N. Lamond; Sgt. W. J. Phippen; Sgt. H. Shephard; Sgt. P. Whelan.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—P/O. A. G. T. Bradley; Sgt. P. G. Burrell; Sgt. D. Campbell; Sgt. W. D. Carrick; Flt. Sgt. F. Christie; Sgt. H. M. Clark; Flt. Sgt. W. L. Clough; Sgt. A. Dabbs; Sgt. J. F. Deaton; Act. Flt. Lt. G. C. Foers; W/O. M. W. Gilding; P/O. A. E. Glennie; Sgt. J. H. Hadwen; Flt. Sgt. J. W. R. Haley; F/O. A. H. Henderson; F/O. R. W. Hooper; Sgt. S. G. Hunt; Act. Flt. Lt. J. J. Hurley; Sgt. A. W. Jones; Sgt. R. A. Kelly; P/O. T. W. Kenyon; P/O. L. K. Kershaw; Act. Flt. Lt. W. R. McKay; Flt. Lt. E. P. F. L. T. Magruder; Sgt. L. Millband; Sgt. H. S. Moore; P/O. R. B. Muirhead; Sgt. C. A. Newman; Sgt. C. Owens; Sgt. S. H. Parker; P/O. V. H. Parry; Act. Sqn. Ldr. R. J. S. Parsons; Flt. Sgt. C. Pattisson; Flt. Sgt. D. J. Popple; Sgt. J. Preston; Sgt. C. Racine; F/O. E. Rawle; Sgt. M. H. Rawlins; F/O. P. D. Short; Sgt. A. Skinner; Sgt. L. Smythson; Sgt. G. W. Spowart; Sgt. A. I. Steel; Flt. Sgt. R. A. Stevenson; Flt. Sgt. P. Stewart; Sgt. H. E. Sullivan; P/O. T. W. Sutton; Sgt. A. Taylor; Sqn. Ldr. A. C. Triptree; Sgt. J. O. Wellard; P/O. E. B. Williams; Sgt. W. P. L. Wood; Sgt. H. Wright.

PREVIOUSLY REPORTED MISSING, NOW REPORTED DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—Sgt. J. H. Bryan; Sgt. D. Jackson.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. P. A. Chapman.

MISSING.—Sgt. W. S. Ashworth; Sgt. J. Bailey; Sgt. W. H. Bailey; Sgt. A. Baldwin; Sgt. R. W. Baybut; Flt. Sgt. L. L. Bernthal; Sgt. E. Betts; Sgt. A. T. Bishop; Sgt. E. R. Black; F/O. D. C. Bradshaw; Sgt. C. A. Britten; Sgt. J. Brown; Sgt. W. R. Bryans; Sgt. G. J. Cairncross; Sgt. J. J. Close; Sgt. D. H. Cockram; Sgt. J. J. Costello; Sgt. A. S. Cousins; Sgt. F. A. Dalton; Flt. Sgt. H. E. Davies; Sgt. R. E. Debben; Sgt. W. Dench; Sgt. W. H. Dickinson; Sgt. W. Dimmick; Sgt. M. Dixon; F/O. E. D. Eastwood; Sgt. J. Eccles; Sgt. A. E. H. Edwards; Sgt. S. C. Eyles; Sgt. V. Eyton-Jones; Sgt. S. Foster; Sgt. R. W. Freeman; Sgt. D. R. Fullager; Sgt. J. S. Garnham; Sgt. S. Gaskin; Sgt. A. Giblin; Sgt. J. Hall; Flt. Sgt. J. Hancock; Flt. Sgt. J. Hawkes-Reed; Sgt. J. McC. Helm; P/O. R. L. Hendry; Sgt. R. J. Herbert; Sgt. R. Hobby; Sgt. H. A. Horrell; Sgt. R. H. Ingram; Sgt. J. Irwin; Sgt. F. B. Jackson; Sgt. L. F. Jeffries; Sgt. J. S. Johnston; P/O. W. D. Joy; P/O. H. E. Kesseck-Philip; Sgt. E. W. King; Sgt. R. F. Knight; F/O. R. K. Lamb; Flt. Sgt. H. Langlands; Sgt. D. Lock; Sgt. J. M. Macdonald; Sgt. A. McDowall; Sgt. A. McKechan; Sgt. E. D. C. Mackintosh; Flt. Sgt. J. Macmillan; Sgt. J. H. McNess; F/O. K. Marsland; Sgt. C. J. P. Meyer; Sgt. M. J. Morgan; Sgt. V. G. A. Moss; Sgt. C. A. Neal; Sgt. D. W. Neal; Sgt. F. J. Nelson; F/O. H. A. Nock; F/O. E. B. Oldham; F/O. L. P. Oldham; Sgt. T. A. Oliver; Sgt. J. Orr; F/O. F. R. Ousey; P/O. P. J. Page; Flt. Sgt. J. Pass, D.F.M.; F/O. W. Paton; P/O. A. F. J. Perrott; Sgt. K. V. Pike; Sgt. J. Redman; Sgt. D. D. Rhynd; Sgt. J. Richardson; F/O. I. H. Robertson; P/O. W. T. Shannon; Sgt. G. G. Shepherd; P/O. R. B. Smith, D.F.C.; Sgt. J. G. Stevenson; F/O. J. H. Stewart; Sgt. A. R. Stone; Sgt. J. W. Sturgess; F/O. K. Toner; Sgt. E. E. Tyler; Sgt. L. R. Vincent; Sgt. J. T. Vodden; Sgt. C. H. J. Walklin; Sgt. F. H. Walton; F/O. G. M. M. Webb; Flt. Sgt. J. C. Welch; F/O. H. C. Wheal; Sgt. H. W. C. Wheeler; Sgt. G. R. White; Sgt. A. C. Whitman; Sgt. P. E. Wilkins.

KILLED ON ACTIVE SERVICE.—P/O. G. Chambers; Flt. Sgt. L. Clark; F/O. F. C. Creed; Sgt. F. H. Doe; Sgt. F. E. Harrison; Sgt. A. C. Horley; A/C.1 K. Horrocks; P/O. J. A. Jackson; Sgt. I. G. Jones; Sgt. J. R. R. Jones; Sgt. J. H. G. Kirby; F/O. M. Mathew; Sgt. W. E. J. Powell; Sgt. C. F. A. Rivers; F/O. T. J. L. Rushton, D.F.C.; Sgt. R. C. Selth; F/O. R. A. Whitmore.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—L.A/C. F. A. Elliott; A/C.2 S. A. Whiting.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. F. C. Butler; Sgt. S. A. Jupp; Sgt. G. F. Parkinson.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Sgt. L. E. Edwards; Sgt. R. L. Wynniatt.

DIED ON ACTIVE SERVICE.—A/C.2 R. G. Brooks; A/C.2 A. Hardy; P/O. G. Mattinson; A/C.1 J. Nannery; A/C.2 T. E. Rule; Cpl. P. P. Walsh; L.A/C. G. R. A. Williams; Cpl. J. Wilson; Act. P/O. R. D. Witts.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—Sgt. T. T. Slater; P/O. R. A. C. Spranger; Sgt. H. Sutterby; Sgt. H. E. Thompson.

Women's Auxiliary Air Force

DIED ON ACTIVE SERVICE.—A/CW.2 J. Scargill.

Royal Australian Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. G. H. Green; Sgt. T. Woodhouse.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—P/O. E. H. T. Alderson; Sgt. H. W. Holgate; Sgt. W. B. Knox-Williams; F/O. D. I. Stewart; F/O. O. L. Wennholm.

MISSING.—Sgt. G. W. Addinsall; P/O. S. B. Elliott; Flt. Sgt. W. Miller.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Flt. Sgt. A. H. Anderson.

Royal Canadian Air Force

KILLED IN ACTION.—P/O. A. C. Law.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. L. Arbuckle; Flt. Sgt. H. T. Boyes; Sgt. H. E. Johnson; Flt. Sgt. A. G. Lee; Flt. Sgt. G. E. Lewis; Sgt. J. A. Longley; Sgt. L. Lowe; F/O. M. M. Tomlinson.

PREVIOUSLY REPORTED MISSING, NOW PRE-

SERVICE AVIATION

SUMED KILLED IN ACTION.—Flt. Sgt. B. A. Brophy; F/O. W. S. Crawford; F/O. S. J. Cybulski, D.F.C.; Sgt. E. G. Jones; F/O. L. R. Mann; P/O. H. A. Massey; Sgt. L. E. Mathews; Sgt. A. R. O'Dell; Sgt. R. D. Peters; Flt. Sgt. J. R. Rebstock; F/O. J. P. Sullivan.

WOUNDED OR INJURED IN ACTION.—P/O. C. S. Miller.

MISSING.—Sgt. G. N. Acton; Sgt. D. Aiken; P/O. J. I. Anderson; P/O. L. MacD. Anderson; Sgt. W. E. Armstrong; Sgt. J. P. E. Balderston; Sgt. M. Barrett; P/O. G. R. Bousfield; P/O. R. B. Brown; Sgt. J. S. D. Caulderwood; Sgt. P. K. Chambers; Sgt. H. A. McI. Clee; F/O. F. C. Culbert; Sgt. J. A. Davie; Sgt. H. Dewar; P/O. F. W. Frudd; Sgt. B. H. Garoutte; Sgt. D. A. Hogg; P/O. J. D. B. Hunter; Sgt. R. E. Labrie; F/O. H. B. Lancaster; Sgt. J. H. McClung; Sgt. L. H. A. McCormick; Flt. Sgt. J. L. McGill; Sgt. S. J. McIlrath; Sgt. J. F. Male; Flt. Sgt. H. E. Mayer; Sgt. B. R. Milligan; P/O. R. F. Moore; F/O. L. R. Nussbaum; Flt. Sgt. B. La V. Owen; Sgt. M. G. Petz; Sgt. C. W. Preston; P/O. J. Rankin; Sgt. G. V. V. Reid; F/O. J. W. Richardson; Sgt. C. N. Roy; Sgt. V. H. Shea; Sgt. J. J. Stefanchuk; P/O. W. H. Taylor.

KILLED ON ACTIVE SERVICE.—P/O. E. W. Scrogge; Sgt. W. R. Willard.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. M. Ball; Sgt. J. Denis; Sgt. J. H. Elliott.

Royal New Zealand Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. L. W. Streeter.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. C. H. Brandon; Sgt. R. J. Roe; Flt. Sgt. J. M. Welsh.

MISSING.—Flt. Sgt. D. J. Martin.

South African Air Force

WOUNDED OR INJURED ON ACTIVE SERVICE.—Capt. E. A. Endler; 2/Lt. W. Muller.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—Flt. Sgt. M. M. Coetzee.

Casualty Communiqué No. 281.

Of these names in the list 99 are second entries giving later information of casualties published in earlier lists.

Royal Air Force

KILLED IN ACTION.—Sgt. J. W. Baxter; F/O. J. A. N. Dawkins; Sgt. J. R. Whittaker.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. A. C. Davis; Sqn. Ldr. J. C. Simpson; Flt. Lt. C. B. Walter.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—F/O. J. S. Abel; Sgt. C. G. Adnams; F/O. R. D. Ambrose; Sgt. T. F. Bailey; P/O. W. Bain; Sgt. F. Barker; W/O. O. R. Bowerman; Sgt. F. E. A. Box; Sgt. G. L. Boxall; Sgt. B. J. W. Boyle; Flt. Sgt. A. C. Burne; Sgt. C. L. Cockburn; Sgt. R. E. Cooke; Flt. Sgt. F. J. Craven; Flt. Sgt. L. W. Cronk; Sgt. T. Elder; Sgt. L. W. Giles; Sgt. W. J. Godly; Flt. Sgt. R. A. Golding; Sgt. R. E. Hayman; Sgt. W. N. Hopwood; P/O. G. Hoskins; Sgt. M. R. Hutson; F/O. C. G. Jones; Sgt. B. J. Ketchell; Sgt. E. J. King; F/O. H. W. Larkins; Sgt. R. Lind; Sgt. K. Loach; Sgt. F. McNeil; Sgt. J. Milner; Flt. Sgt. R. A. S. Mitchell; Sgt. R. G. Mockeridge; Sgt. R. H. Neade; Flt. Sgt. L. C. Norman; Sgt. D. Northey; Sgt. G. E. P. O'Connor; P/O. C. E. Ody; Sqn. Ldr. C. D. Palmer, D.F.C.; Sgt. W. C. Parry; Sgt. P. N. Reed; Act. Wing Cdr. J. K. Rogers; Flt. Sgt. D. Salisbury; Act. Flt. Lt. T. A. D. Sassoon; Sgt. A. M. Smith; Flt. Sgt. F. A. Stillman; Sqn. Ldr. I. C. Strutt, D.F.C.; P/O. J. R. P. Taylor; Sgt. G. G. Tennant; Sgt. A. W. Thomas; Sgt. K. J. Thorne; Sgt. A. Trewin; Flt. Sgt. J. W. Tyson; Sgt. R. H. Walker; Sgt. H. H. Warren; Sgt. R. Webb; Sgt. K. H. Whitmore; Sgt. J. A. D. Wildish; Flt. Sgt. R. P. Williams; Sgt. J. H. Young; F/O. S. W. Young.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW REPORTED KILLED IN ACTION.—Sgt. T. J. Davey.

WOUNDED OR INJURED IN ACTION.—W/O. J. A. S. Allen; Sgt. J. C. McDougall.

PREVIOUSLY REPORTED MISSING, NOW REPORTED DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—F/O. G. O. Gardner.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. J. Adsetts; Sgt. T. I. L. Dagg; Sgt. G. A. Denney; Sgt. R. A. Grace; P/O. E. Harper; Sgt. C. D. Herbert; Sgt. F. Hill; Sgt. L. Howarth; Sgt. C. V. L. R. Hulbert; Sgt. W. G. Johnson; Sgt. T. R. Jones; Sgt. D. M. Lewis; F/O. A. MacKay; Sgt. C. A. Morris; Flt. Sgt. T. P. Murphy; Flt. Sgt. M. Neill; Sgt. L. M. Preece; Sgt. N. E. Rivers; Sgt. G. J. Samuel; Sgt. J. A. Sykes; Sgt. A. Tooth; Sgt. A. A. Walrond; Sgt. G. White.

MISSING.—Sgt. R. E. Archer; F/O. C. H. Ashworth; Sgt. F. D. Ayerst; Sgt. G. T. Beveridge; Sgt. H. C. Billett; Flt. Sgt. F. Birkin; Sgt. S. Bonner; F/O. W. R. Booker; Sgt. J. R. Boxall; Sgt. R. V. Boyd; Sgt. K. Broadhurst; Sgt. J. L. Burnside; Sgt. W. C. Butler; Sgt. D. W. B. Channing; P/O. H. W. Chester; Sgt. H. T. Clarke; Sgt. L. J. Clover-Price; Sgt. R. J. Cockshott; Sgt. R. J. Coggins; Sgt. D. Coles; Sgt. F. C. Compton; Sgt. W. W. R. Cook; Sgt. R. A. Cooper; Sgt. K. B. Coulter; Sgt. J. H. Davies; Sgt. F. W. Davis; Sgt. S. J. Devereux; Sgt. J. E. Dickson; Sgt. J. Douglas; Sgt. A. C. E. Drake; Sgt. D. R. G. Eldridge; Sgt. E. W. Evans; F/O. P. E. Fielding; Sgt. R. Franklin; Sgt. G. W. Fuller; Sgt. K. W. Gadsdon; Sgt. J. L. Garfit; Sgt. H. H. Gentle; Sgt. S. K. Gorden-Powell; Sgt. E. Grainger; Flt. Sgt. I. W. Grew; Sgt. R. E. Grey; Sgt. G. M. Hacker; F/O. F. R. Haines; Sgt. A. D. Hall; Sgt. L. Harris; Sgt. W. J. Herrington; Sgt. W. W. Hill; Flt. Sgt. M. D. Horner; P/O. J. L. R. Houlston; Sgt. B. L. Howard; Sgt. W. Hughes; Sgt. J. B. Keen; Sgt. D. P. Kelly; Sgt. F. S. Kennedy; Sgt. R. A. Kennedy; Sgt. E. Kent; Act. Sqn. Ldr. F. J. Knight; Sgt. E. F. Lawrence; F/O. E. E. Lawton; Sgt. B. E. Lewis; Flt. Sgt. J. Livesay; Sgt. J. T. Lloyd; Sgt. R. J. McAuley; F/O. T. F. McCrorie; Sgt. G. E. Matthews; Sgt. A. Monaghan; P/O. K. E. Moon; Sgt. K. Moore; Sgt. K. D. S. Mordecai; Flt. Sgt. M. P. Noble; Sgt. T. A. Owen; Flt. Sgt. J. Parker; Sgt. L. M. Parkins; Sgt. G. C. Parritt; Sgt. E. W. V. Pierce; Sgt. G. A. Pryke; Sgt. W. Quaile; Sgt. A. C. Redshaw; Sgt. J. Reffin; Sgt. A. W. Richardson; Sgt. M. Riley; F/O. E. Sanderson; F/O. G. Sansom; P/O. A. F. Saunders; Sgt. R. K. Scott; Sgt. D. Scragg; Flt. Lt. F. P. Seward; Sgt. D. W. Sigourney; Sgt. A. Smith; Flt. Sgt. K. I. Smith; Sgt. L. W. Smith; Sgt. J. N. Sparkes; P/O. W. Stuckey; P/O. J. P. Tay; Act. W/O. A. J. Thomas; Sgt. D. Thomas; F/O. J. A. Thompson; Flt. Sgt. F. G. Thomson; Sgt. R. B. Twitchen; Sgt. C. G. L. Vallance; Sgt. P. F. P. Venton; Sgt. H. W. G. Vickers; Sgt. V. H. J. Watkins; Sgt. F. Wheeldon; Sgt. R. H. Willshire; Sgt. R. Winn; P/O. C. B. Wood; Sgt. M. Wood.

KILLED ON ACTIVE SERVICE.—Sgt. N. Bosworth; Sgt. R. C. E. Brown; Sgt. W. E. Davies; P/O. G. E. A. Grey; L.A/C. S. Harris; Sgt. H. T. Moffett; F/O. D. Patten; Flt. Lt. T. F. Procter; Sgt. W. C. Rodger; Sgt. H. G. Sanders.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Sgt. A. Cowie.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. D. Rainton; P/O. G. M. Roberts; P/O. K. F. Wiltshire.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Sgt. W. S. H. Menzies.

DIED ON ACTIVE SERVICE.—L.A/C. H. C. Battersby; A/C.2 H. Chesworth; A/C.2 R. Cowans; Sgt. S. W. G. Hill; L.A/C. S. N. Hunter; L.A/C. F. Scott; Act. Flt. Lt. C. A. Woollett.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—Sgt. G. Barclay; Sgt. G. Boulton; Flt. Sgt. F. Craig; Sgt. W. P. Heyworth.

Royal Australian Air Force

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—A/C.1 W. O. Chelman; Sgt. A. G. Declerck; Sgt. W. J. C. Monk; Sgt. J. A. Smith; Sgt. K. O. T. Summerville.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—Sgt. J. Burnham.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. P. J. Galligan; Sgt. P. W. J. Rendle.

MISSING.—Sgt. C. Fallon.

KILLED ON ACTIVE SERVICE.—F/O. P. J. Dunn; Sgt. G. K. Stokes.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. E. J. Warren.

"GONGED" SQUADRON: Aircrews of the Beaufighter squadron commanded by Wing Cdr. Paddy Green, D.S.O., D.F.C. The Hon. Air Commodore of the squadron is Sir Archibald Sinclair. Operations in England and Malta have brought the squadron's score to 96 enemy aircraft destroyed. Forty one of these were shot down in 31 nights over Sicily. Every one of the men in this photograph is wearing a decoration.

Royal Canadian Air Force

KILLED IN ACTION.—F/O. R. A. Dunbar.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—P/O. F. W. Henderson; Flt. Sgt. A. G. MacKay; Sgt. C. R. Patton.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. C. A. Davis; Sgt. R. F. Gourlay; Sgt. J. F. Irvine; Sgt. D. A. Ivers; P/O. C. G. T. McGregor; Sgt. A. H. Pepper; F/O. A. T. Persian; Sgt. D. R. Philip; Sgt. E. F. Stammers; Sgt. C. E. Stuart; Flt. Sgt. D. G. Williams.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW REPORTED KILLED IN ACTION.—Sgt. S. C. F. Summers.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED IN ACTION.—Sgt. B. V. L. Ducker; Sgt. R. W. Stockton; Flt. Sgt. J. O. Waltenbury.

WOUNDED OR INJURED IN ACTION.—Flt. Sgt. W. J. B. Newcombe.

MISSING, BELIEVED KILLED IN ACTION.—P/O. D. R. Agnew; Flt. Lt. N. A. Cobb, D.F.C.; Sgt. W. A. Hood; Sgt. R. M. Lawrence; F/O. R. G. McKessock; P/O. W. B. Mayes; Sgt. W. R. Townsend; Sgt. J. H. W. Walker.

MISSING.—F/O. F. S. Buck; P/O. G. P. Bray; Sgt. L. E. Carey; P/O. H. W. Fowler; Sgt. C. V. Howden; Sgt. C. R. James; Sgt. R. D. W. Moulton; Sgt. W. G. Otterholme; F/O. P. J. Pascoe; Flt. Lt. A. C. Raine; F/O. P. C. D. Russell; Sgt. R. D. Tod, D.F.M.; Sgt. R. E. Tod; P/O. H. C. Treherne; Flt. Sgt. A. E. Vidal.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—P/O. R. F. Ready.

KILLED ON ACTIVE SERVICE.—Sgt. D. M. Flack; Sgt. F. E. Gladwin; F/O. P. D. Lidster; Sgt. W. G. Mitchell; P/O. R. E. Nutter; F/O. F. S. Taylor.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW REPORTED KILLED ON ACTIVE SERVICE.—F/O. H. D. Milne.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. R. MacLaughlan; Sgt. W. H. Palmer.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Sgt. W. R. Barclay.

Royal New Zealand Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—W/O. F. A. Schaw.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. J. A. Morgan; Flt. Sgt. N. J. Sutherland.

MISSING.—Flt. Sgt. E. H. Capewell; Sgt. L. Hurst; Sgt. A. B. Parton; F/O. R. J. Peattie; Flt. Sgt. J. L. Richards; Flt. Sgt. H. Tomoana.

South African Air Force

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—Flt. Sgt. B. C. Rowe.

Indian Air Force

DIED ON ACTIVE SERVICE.—A/C.2 Sivagurunathan.

Official Correction

Casualty Communiqué No. 271.

R.C.A.F. Sgt. M. G. Low was erroneously presumed "Killed in Action." His name should have appeared under "Previously Reported Missing, Believed Killed in Action, Now Reported Prisoner of War."